
ADT-DK300A/400A

Manufacturer's Manual

Copyright

Adtech (Shenzhen) Technology Co., Ltd. (Adtech hereafter) is in possession of the copyright of this manual. Without the permission of Adtech, the imitation, copy, transcription and translation by any organization or individual are prohibited. This manual doesn't contain any assurance, stance or implication in any form. Adtech and the employees are not responsible for any direct or indirect data disclosure, profits loss or cause termination caused by this manual or any information about mentioned products in this manual. In addition, the products and data in this manual are subject to changes without prior notice.

All rights reserved.

Adtech (Shenzhen) Technology Co., Ltd.

Version History

[illegible]

Remark:

We have collated and checked this Manual strictly, but we can't ensure that there are no error and omission in this Manual. Due to constant improvement of product functions and service quality, any products and software described in this manual and the content of the manual are subject to changes without prior notice.

Contents

1.	OVERVIEW	1
1.1	SYSTEM FUNCTION	1
1.1.1.	Self-diagnosis.....	1
1.1.2.	Compensation	1
1.1.3.	Abundant instruction system	1
1.1.4.	Full Chinese menu operation & full screen edit	1
1.1.5.	Abundant error-correction functions	1
1.1.6.	Program exchange between CNC system and PC	2
1.1.7.	System operating condition.....	2
2.	OPERATING PANEL	3
2.1	LCD/KEYPAD	3
2.2	SYSTEM MENUS.....	4
2.3	OPERATING KEYS	7
3.	MANUAL OPERATION.....	9
3.1	RETURNING TO REFERENCE POINT MANUALLY	9
3.2	CONTINUOUS FEEDING MANUALLY	11
3.3	SINGLE STEP FEEDING	11
3.4	HANDWHEEL FEEDING	12
3.5	MANUAL AUXILIARY FUNCTION OPERATION.....	12
3.6	WORKING COORDINATE SYSTEM SETTINGS (TOOL SETTING)	14
3.6.1.	Enter current position to specified coordinate system directly (all axes)	14

3.6.2.	Coordinate axis settings	16
3.6.3.	Modify coordinate value	18
3.7	DATA SETTINGS	19
3.7.1.	Tool compensation data setting.....	19
3.7.2.	System parameter setting	22
3.8	FAST SYSTEM OPERATION	22
4.	AUTOMATIC OPERATION	24
4.1	AUTOMATIC OPERATION	24
4.2	MDI OPERATION	25
4.3	USB DISK DNC	26
4.4	SPEED RATE ADJUSTMENT.....	27
4.5	SBK FUNCTION	28
4.6	BDT FUNCTION	28
4.7	STOPPING AUTOMATIC OPERATING.....	28
5.	SAFE OPERATION.....	29
5.1	EMERGENCY STOP.....	29
5.2	HARD LIMIT OVER TRAVEL.....	30
5.3	SOFT LIMIT OVER TRAVEL.....	30
6.	ALARM AND SELF- DIAGNOSIS FUNCTION	30
6.1	NC PROGRAM EXECUTION ALARM	30
6.2	SYSTEM ENVIRONMENT ALARM	33
6.3	ALARM PROCESSING	35

6.4	SELF-DIAGNOSIS FUNCTION.....	35
7.	PROGRAM SAVING & EDITING	36
7.1	SAVING THE PROGRAM IN THE MEMORY	36
7.1.1.	Keypad input (new program).....	36
7.1.2.	PC serial port input.....	37
7.1.3.	Copying processing files from USB disk	37
7.2	READING PROGRAMS INTO WORK AREA.....	37
7.2.1.	Reading programs from controller into work area	37
7.2.2.	Reading programs from USB disk into work area	37
7.3	EDITING & MODIFYING PROGRAMS	38
7.4	DELETING FILES	38
7.4.1.	Deleting files in memory	38
8.	MAIN INTERFACES OF THE SYSTEM	38
8.1.	POSITION INTERFACE	38
8.1.1.	Absolute position	39
8.1.2.	Relative position.....	39
8.1.3.	Comprehensive coordinates.....	40
8.2.	EDIT INTERFACE.....	41
8.3.	PROGRAM EDIT	41
8.4.	SYSTEM INFO INTERFACE.....	42
8.5.	MDI INTERFACE	43
8.6.	FILE MANAGEMENT.....	44

8.7.	GRAPHIC SIMULATION	45
8.8.	PARAMETER INTERFACE	46
8.9.	COMPENSATION INTERFACE	50
8.10.	WORKPIECE COORDINATE SYSTEM SETTING INTERFACE	51
8.11.	CONTROLLER DIAGNOSIS INTERFACE (DIAGNOSIS)	52
8.12.	MACRO VARIABLE VIEW INTERFACE (MACRO VARIABLE)	55
8.13.	CURRENT MODE INSTRUCTION INFO.....	56
9.	SYSTEM MAINTENANCE	58
9.1.	RESTART	58
9.2.	SYSTEM UPGRADE	59
9.3.	RESTORE FACTORY PARAMETERS	60
9.4.	PARAMETER BACKUP AND RESTORE	61
9.5.	ENTERING BIOS	62
10.	SYSTEM PARAMETERS	63
10.1.	PARAMETER INDEX LIST	64
10.2.	GENERAL PARAMETER (P1.)	86
10.3.	AXIS PARAMETER CONFIGURATION (P2.)	106
10.4.	MANAGEMENT PARAMETER (P3.)	118
10.5.	TOOL MAGAZINE PARAMETERS (P4.)	124
10.6.	PRINCIPAL AXIS PARAMETER (P5.)	127
10.7.	PORT CONFIGURATION (P6.)	130
11.	HARDWARE INTERFACE DEFINITION AND CONNECTION INSTRUCTIONS	140

11.1.	INSTALLATION LAYOUT	140
11.1.1.	External interface diagram	140
11.1.2.	Mounting dimensions	141
11.1.3.	Installation precautions.....	142
11.2.	INTERFACE DEFINITION.....	144
11.2.1.	Motor drive control interface (XS1...XS4)	144
11.2.2.	Digital input interface (XS5).....	148
11.2.3.	Digital output interface (XS6)	151
11.2.4.	Handheld box interface (XS7)	153
11.2.5.	Analog output interface (XS8)	154
11.2.6.	RS232 transmission interface (XS9)	155
11.2.7.	USB memory connection interface (XS10).....	156
11.2.8.	PC USB communication interface (XS11).....	156
11.3.	ELECTRICAL CONNECTION DIAGRAM.....	156
11.3.1.	Symbol schematic diagram.....	156
11.3.2.	Power connection diagram.....	157
11.3.3.	Servo drive connection diagram.....	158
11.3.4.	Step connection diagram.....	159
12.	CONFIGURATION AND SYSTEM FUNCTIONS.....	160
12.1	SYSTEM CONFIGURATION	160
12.2	SYSTEM TECHNICAL PARAMETERS.....	161

Foreword

DK300A/400A numerical control system is developed by Adtech (Shenzhen) Technology Co., Ltd. for engraving industry, where DK300A is three axes motion controller.

Instructions and reading convention of the Manual

Before using this CNC system, please read this Manual carefully to operate properly.

Terminology note and reading convention in this Manual:

DK300A and DK400A are control systems with different axes and same hardware functions. Different software has different functions and masks.

“CNC system”, “NC controller” and “DK300A” mentioned in this Manual all refer to DK300A/DK400A;

The articles marked with “Caution” prompt users to pay special attention for operation or setting, or else this operation may fail or certain action can't be performed.

1. Overview

1.1 System function

1.1.1. Self-diagnosis

Diagnose CPU, memory, LCD, I/O interface, parameter state, coordinates and processing program comprehensively every time the system is started or reset; diagnose power supply, principal axis, limit and I/O ports in real-time during operating.

1.1.2. Compensation

Automatic reverse clearance compensation

Automatic tool length compensation

Automatic tool radius compensation

Automatic tool radius biasing and automatic tool tip transition

1.1.3. Abundant instruction system

Scaling instruction

Mirror processing instruction

Tool biasing instructions

Program cycle, program skip, program shift, program transfer, different end processing modes, macro definition and program management instructions

Fixed-point instructions: starting point, setting point, etc.

Linear, arc and spiral interpolation instructions

Six workpiece coordinate systems, nine extension coordinate systems and one reference point

1.1.4. Full Chinese menu operation & full screen edit

DK system uses cascading menu structure and full Chinese operation to ensure simple operation and visibility.

1.1.5. Abundant error-correction functions

Point out the nature and correct the errors in operation.

1.1.6. Program exchange between CNC system and PC

Perform CAD/CAM/CAPP auxiliary programming with abundant software in PC, and then transmit CNC program to the system through communication interface (USB disk, RS232 interface), or transmit the programs from the system to PC.

1.1.7. System operating condition

Operating voltage	24V DC (with filter)
Operating temperature	0℃~ 45℃
Optimum operating temperature	5℃~ 40℃
Operating humidity	10%~90% (no condensing)
Optimum operating humidity	20%~85%
Storage temperature	0℃~50℃
Storage humidity	10%~90%
Operating environment	No excessive dust, acid, alkali, corrosive and explosive gases, no strong electromagnetic interference

2. Operating panel

2.1 LCD/keypad



Fig. 3.1 DK300A Operating Panel Diagram

Caution:

Press the submenu buttons to perform the operations of submenus.

Manual axis moving and edit & input are composite. It has different definitions according to the modes.

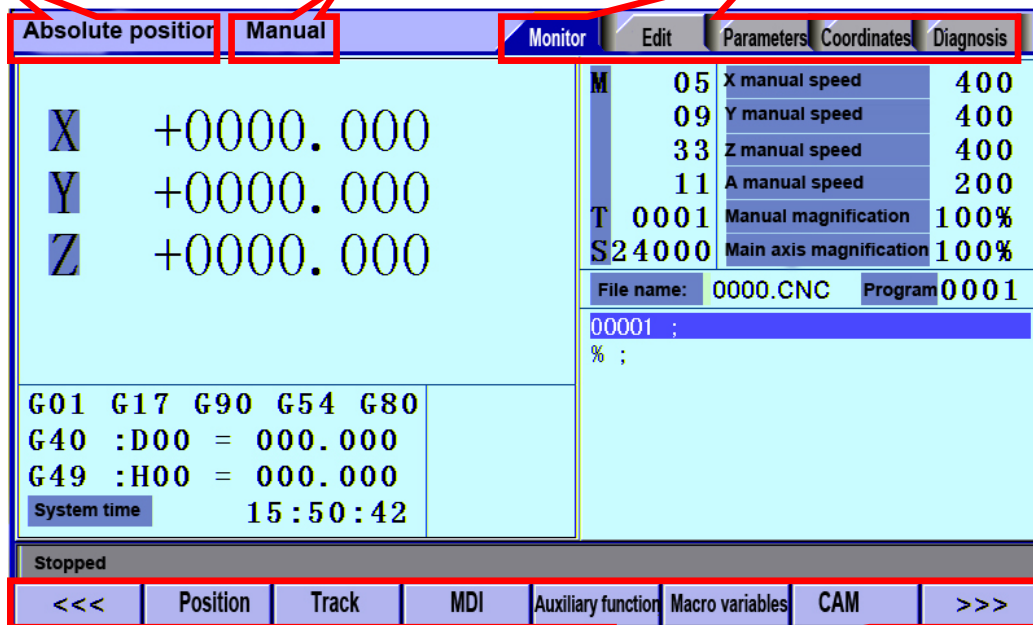
System working mode switch section is used to switch working modes, which can improve the security and system performance. Handwheel and single step mode are switched with Repeat button.

LCD unit

Screen info

Working mode

System main menu



Submenus

Caution:

Screen info shows the information of current window

Working mode info shows currently selected working mode

System main screen shows current main screen.

The submenu options are used to switch submenus with left triangle, F1~F6 and right triangle. The right arrow is used to turn pages, and the left arrow is used to close the submenus in next level and previous menu.

2.2 System menus

DK300A system uses cascading menu structure. You can press the following keys to operate the menus.



Press a key to show the corresponding content in the bottom of the LCD.



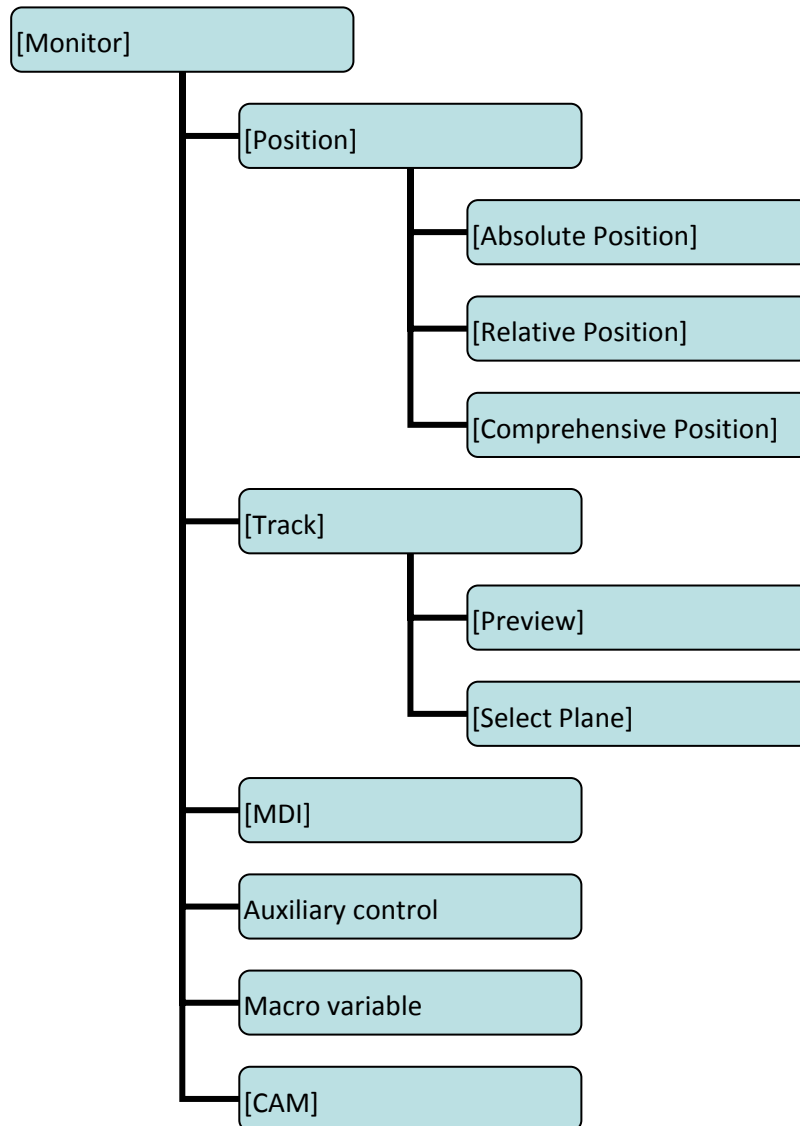
Key in the left: Return to previous menu

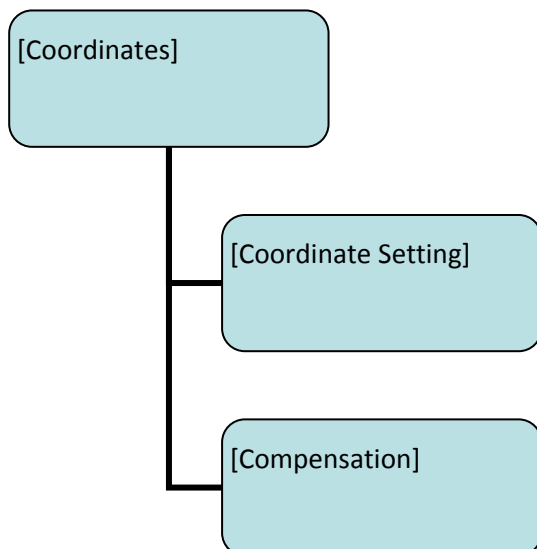
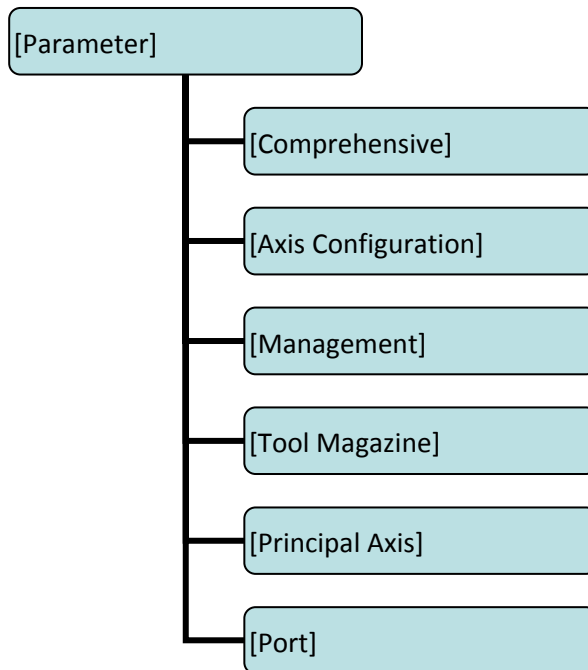
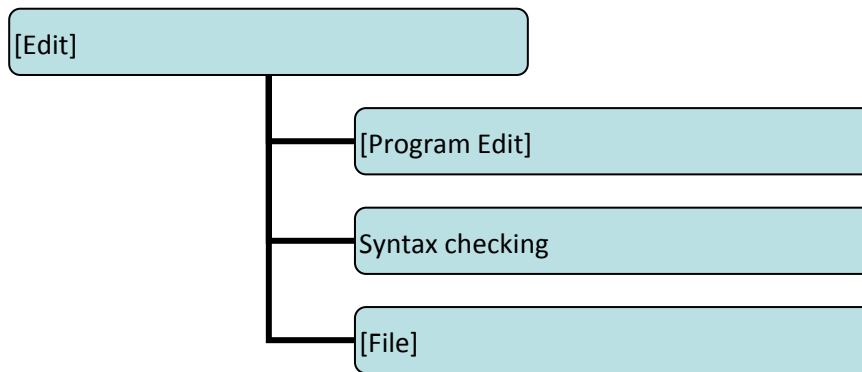


Key in the right: Turn pages to show other menus of same level

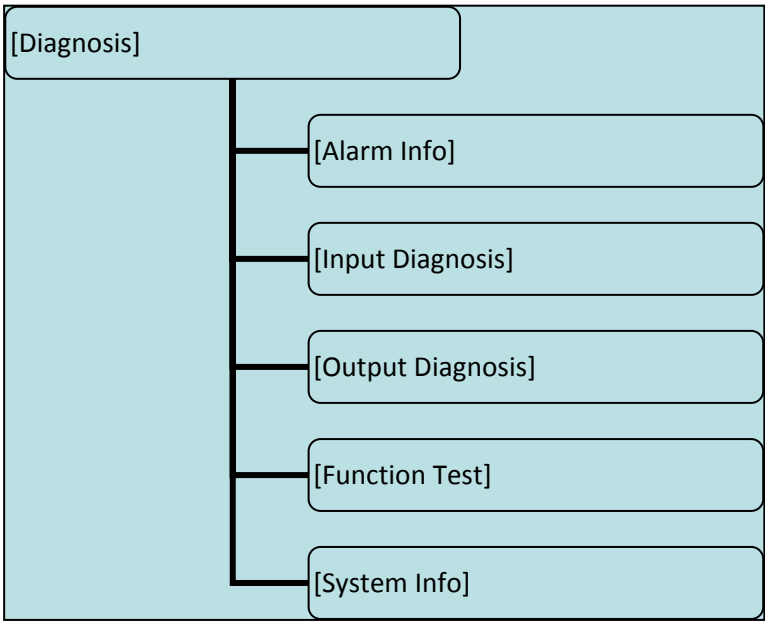


The main menus of the system include [MONITOR], [PROG], [SYSTEM], [COORD] and [DGNOS]. Each main menu contains several submenus, which are shown below:





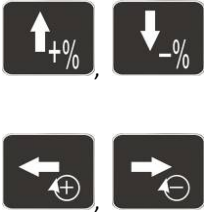
Function test submenu



2.3 Operating keys

The keys of DK300A system are defined below:

Key	Figure	Purpose
[复位/RESET]		Cancel alarm, reset CNC
Address/number keys		Enter letters, numbers, etc.
[EOB], [取消/CAN]		Confirm or cancel operation
[EOB], [取消/CAN], [删除/DEL]		Program edit (insert, delete, modify)
Mode switch key		Select operating mode

Key	Figure	Purpose
Cursor moving key		Four keys are available: Up/Down: adjust ration, move cursor between subsections; Left/Right: move cursor to left/right
Page key		Up/Down: Turn pages
Menu keys		Select the menus
Principal axis positive rotation		Press it to rotate the principal axis positively, and press it again to stop rotating
Principal axis reverse rotation		Press it to rotate the principal axis reversely, and press it again to stop rotating
Coolant		Coolant on/off
Lubricant		Lubricant on/off
[跳选/BDT]		Block delete on/off
[单段/SBK]		Single block function on/off
[暂停/PAUSE]		Pause automatic running

Key	Figure	Purpose
[启动/START]		Start automatic running

3. Manual operation

3.1 Returning to reference point manually

The engraving machine tool has specific mechanical position, which is called as reference point and for tool exchange and coordinates setting. Generally, when the power supply is connected, the tool should be moved to the reference point. This operation is also called as home operation, which will make the CNC system confirm the origin of machine tool.

The home operation includes program and mechanical mode:

For program home, the action completes when the coordinates of machine tool are 0, and won't check whether origin switch is in position;

For mechanical home, the external home sensor switch is used to locate the origin of the machine tool; two checking modes are available:

With the external sensor switch, the home operation completes when the sensing is successfully repeatedly.

The external sensor switch is used as deceleration switch, and the servo home is enabled as home signal after sensing and then the sensing stops.

You can set the "Home mode" in [Parameter] [General parameter], and move to comprehensive home mode (36# parameter) EOB to select. You can also press [SBK] key in home mode to switch among "Mechanical – Program – Mechanical..." quickly. This method doesn't conflict with parameter setting. You can select accordingly. To use servo home as the home signal, you need to set "Axis phase Z home enable" to "1" in [Parameter] [Axis Configuration] in mechanical home mode, and the setting will take effect in next home checking.

Several methods are available for tool returning to reference point and the steps follow:

(1) Each axis returns to reference point separately

 Press the mode switch key [] to select home operation;

 Press the composite key [, [, [, [] in the numbers section to return the corresponding axis to reference point.

(2) The axes return to reference point simultaneously

 Press the mode switch key [] to select home operation;

 Press the [] key to return Z axis to reference point, and other axes return to reference point simultaneously. The automatic home sequence can be configured in the parameters.

(3) Reset machine tool position

 Press the mode switch key [] to select home operation;

 In [Absolute Position] and [Coordinate System] screen, press [, [, [, [] respectively to show the value of corresponding axis, and then press the [] key to reset the absolute position of current axis.

After this operation, the system considers it as a home action. Therefore, when the program is running, the alarm of not home won't occur. If you press by mistake, it will switch the screen and cancel selection automatically.

(4) Reset relative position manually

 Press the mode switch key [] to select manual operation;

 In [Relative Position] and [Coordinate System] screen, press [, [, [, [] respectively to show the value of corresponding axis, and then press the [] key to reset the relative position of current axis.

 Note

The tool also can return to reference point according to program instruction, i.e. returning to reference point automatically.

 Caution:

Generally, the system will perform home operation after connecting the power supply. If the power fails while the machine tool is moving, the system also will return to reference point when the power supply is connected again. Return to Z axis to prevent tool and workpiece from colliding, and damaging tool, workpiece and clamp.

3.2 Continuous feeding manually

Press the keys on the operation panel or handwheel to move the tool along every axis.

The operation follows:

(1) Press the mode switch key  to select manual operation;

(2) Press composite keys , , , , , , ,

 in numbers area to move the tool along selected axis.

In manual mode,  key can be used to switch the manual speed and rapid traverse speed. The rapid traverse speed of every axis depends on General parameter 009-012 (rapid traverse speed setting). After switching to rapid traverse speed, the manual speed of the position interface will be highlighted, while the actual speed of the position interface is sampled from the moving speed of current axis. This value can truly reflect the moving speed of current axis (unit: mm/min);

 Note:

Only single axis motion is available in manual mode.

3.3 Single step feeding

Single step mode is similar to manual mode, the operations are same, but only moves a specified pulse increment every time press the key.

The specific operation follows:

- (1) Press the mode switch key  (this key is composite, and you can press it repeatedly to switch the modes) to select the single step operation;

- (2) Press composite keys  [6 SP],  [4 [],  [8 /],  [2 #],  [7 (],  [3 =],  [9)],



[1 ,] in numbers area to move the tool for a fixed distance along the selected axis. This distance is controlled by four rates (1.000, 0.100, 0.010, 0.001) (unit: mm). To select pulse increment, press



and



key in the [Position] interface.

3.4 Handwheel feeding

In handwheel mode, rotate the handwheel to make the machine perform single step or continuous motion. Determine the feed by testing the handwheel signal of the handheld box. In handwheel mode, the feeding axis and feeding unit are determined by the axis selection signal of the handheld box.

The handwheel feeding step follows:

- (1) Press the mode switch key  to select handwheel operation;

- (2) Rotate the dip switch on the handwheel to select handwheel axis (X, Y, Z, A);

- (3) Rotate the increment dip switch on the handwheel to select the moving amount (0.1, 0.01, 0.001);

(4) Rotate the handwheel to move the machine tool. The tool moves certain distance every time you rotate the handwheel for a scale. (For example, if you select X axis in step (2) and select 0.01 in step (3), the tool moves 0.01mm every scale). Rotate the handle continuously to move the machine tool on this axis continuously.



Note:

The handwheel feeding mode controls only one coordinate axis every time; the faster the handwheel rotates, the faster the machine tool moves.

3.5 Manual auxiliary function operation

Coolant on/off



In handwheel/single step/manual mode, press this key to switch on/off the coolant.

Key indicator: No matter in what mode, the key indicator is on if only the coolant is on, or else the indicator is off.

Lubricant on/off



In handwheel/single step/manual mode, press this key to switch on/off the lubricant.

Key indicator: No matter in what mode, the key indicator is on if only the lubricant is on, or else the indicator is off.

Principal axis positive rotation/stop



In handwheel/single step/manual mode, press this key to rotate the principal axis positively and press it again to stop the axis.

Key indicator: No matter in what mode, the key indicator is on if only the principal axis is positive rotating, or else the indicator is off.

Principal axis reverse rotation/stop



In handwheel/single step/manual mode, press this key to rotate the principal axis reversely and press it again to stop the axis.

Key indicator: No matter in what mode, the key indicator is on if only the principal axis is reverse rotating, or else the indicator is off.

General instructions for manual operation keys



and



are available in handwheel, single step and manual mode;

When the principal axis is rotating, press the reverse rotation key, the principal axis will stop first, and rotate in reverse direction after pressing it again.

When auxiliary output is on, if the system is switched to other modes, the output is unchanged; you need to press “Reset” key to switch it off, execute the corresponding M code in automatic mode or execute the corresponding M code in MDI interface to turn off the output;

When the principal axis is positive/reverse rotating and executes M04/M03 directly, the system first stops positive/reverse rotating and then executes M04/M03 instruction;

Positive/reverse rotating of principal is stopped while emergency stop and other outputs can be set according to system parameters.

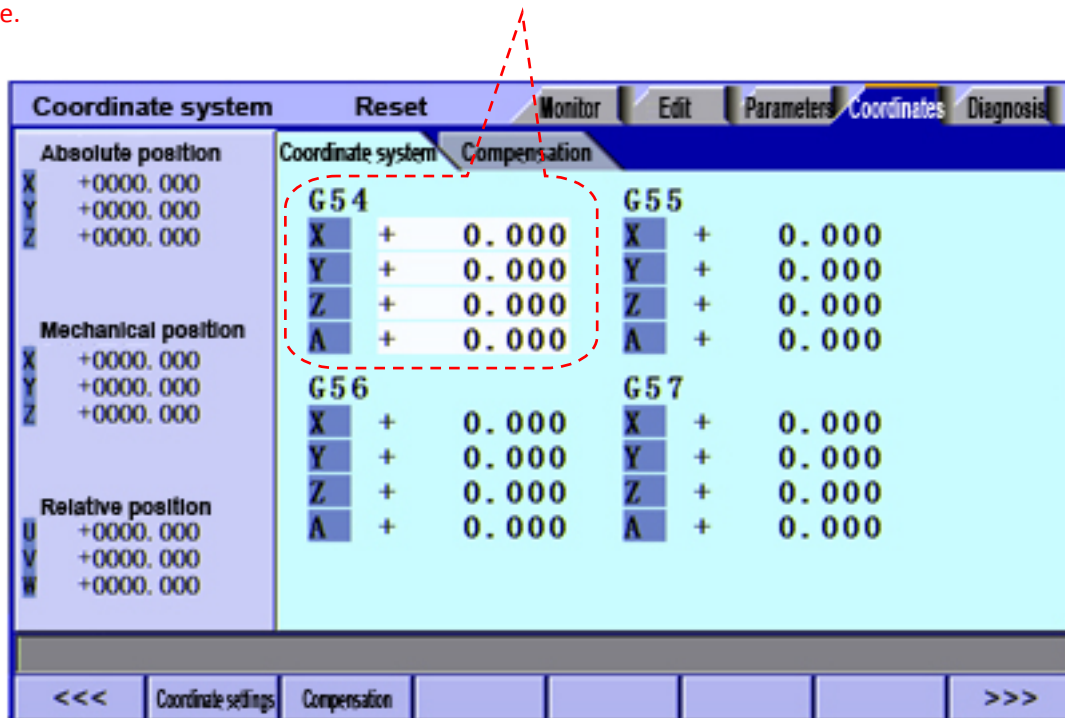
3.6 Working coordinate system settings (tool setting)

Tool setting is the main operation and important skill during CNC processing. Under certain conditions, tool setting precision can determine the processing precision of parts, and the tool setting efficiency also affects the CNC processing efficiency directly. DK300A and DK400A realize tool setting through G54-G59 coordinate system.

Workpiece coordinate system setting method

3.6.1. Enter current position to specified coordinate system directly (all axes)

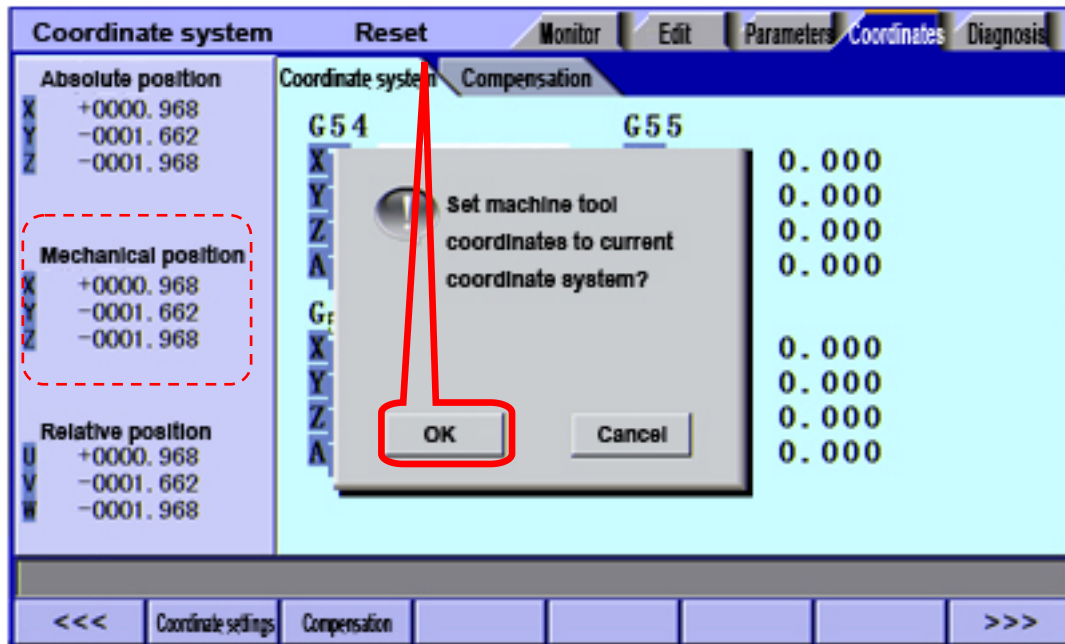
1. Press  to enter the coordinate system interface. The background of select coordinate system is white.



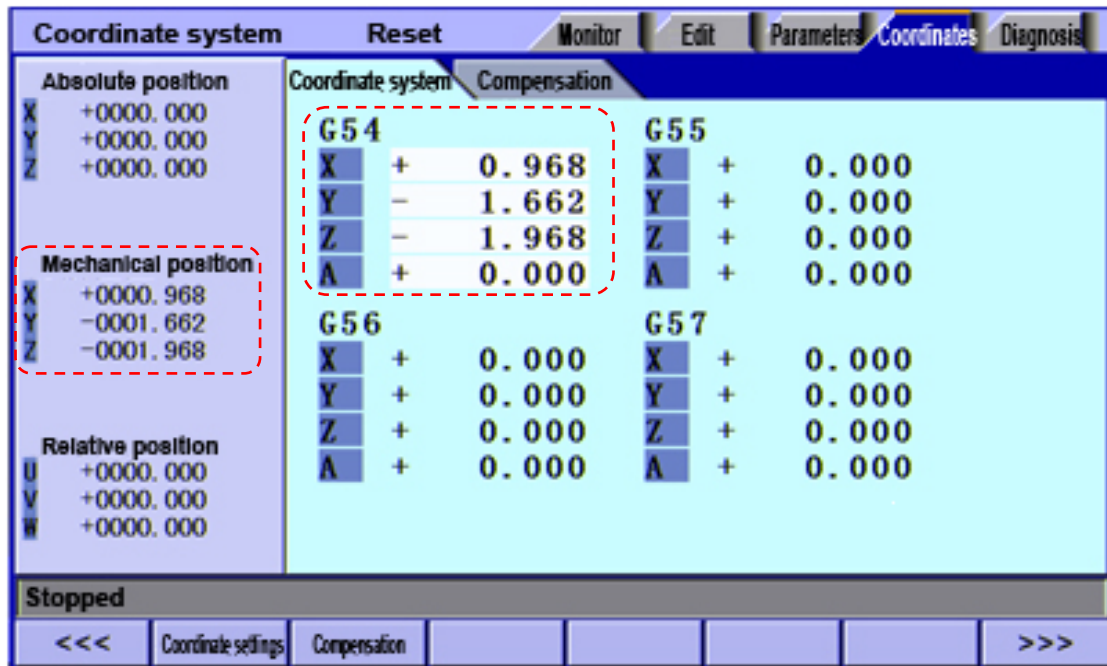
2. Then, press ,  to select the coordinate system, e.g. G54.

3. Press **手动 JOG** to select manual mode, and press **X+ → 6 SP**, **← X- 4 [**, **Y+ ↑ 8 /**, **Y- ↓ 2 #**, **Z+ ↖ 7 (**, **Z- ↙ 3 =**, **A+ ↻ 9)**, **A- ↺ 1 ,** to move the axis to the origin of the coordinate system.

4. Press **EOB** to show a dialog box, and press “EOB” to set current coordinates as the zero point of the program.



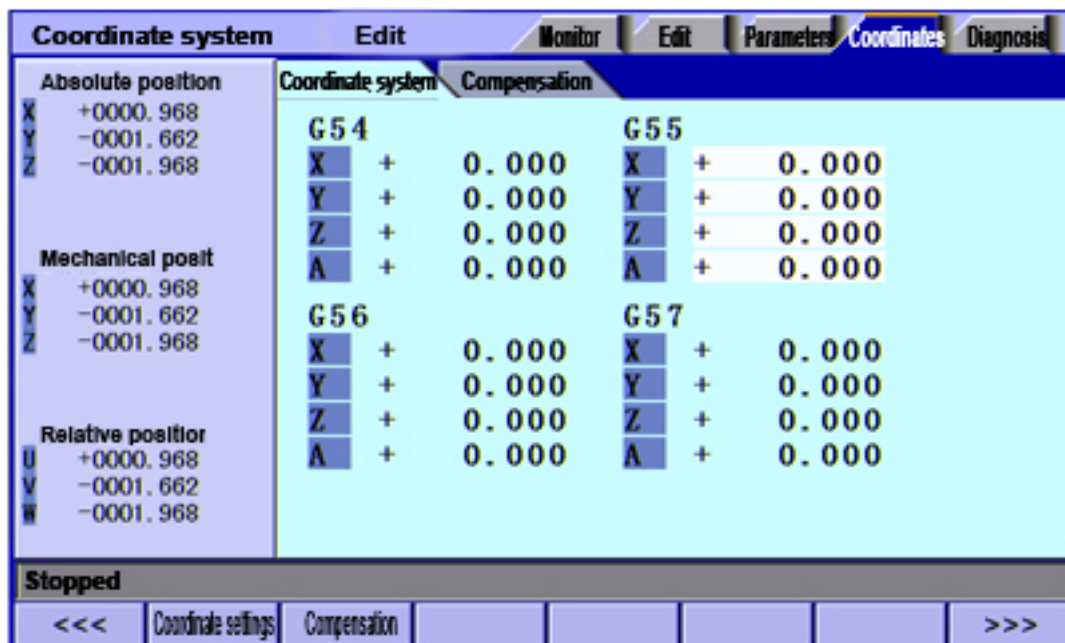
5. After setting the coordinate system, copy the mechanical position values to the axis value in the dotted box as shown in the figure below.



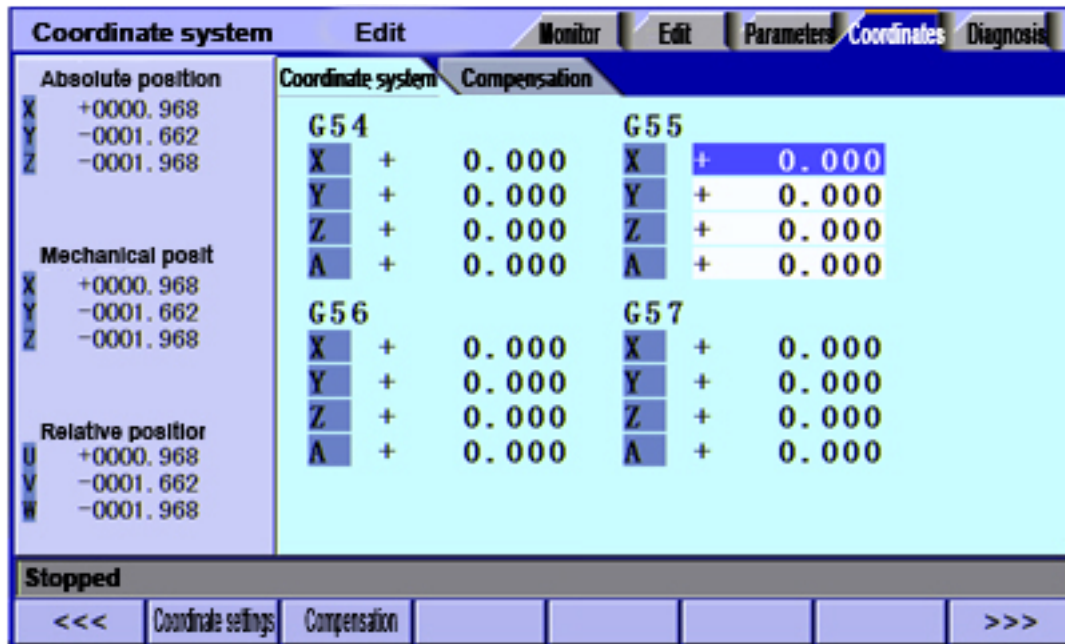
3.6.2. Coordinate axis settings

1. Press  to enter the coordinate system interface.

2. Then, press ,  to select the coordinate system, e.g. G55.



3. Press  to select the edit mode.



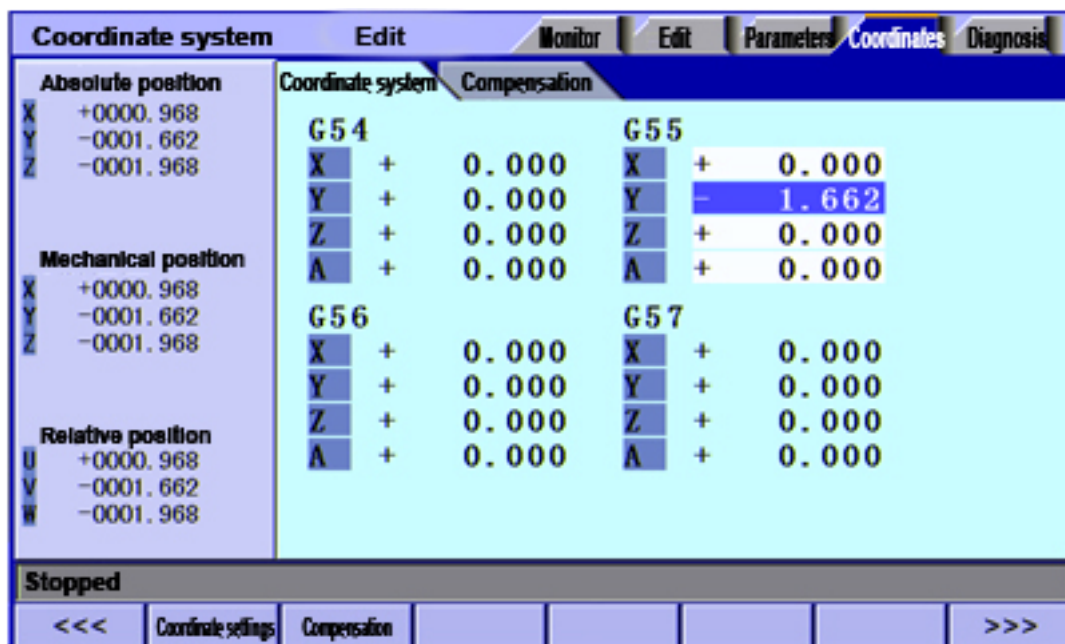
4. Select an axis number; you can press , to move the cursor and select ,



the selected coordinate parameters are shown on blue background; for example,

to select axis X, press , the coordinates of corresponding axis number will be shown, and prompt the values to be inserted.

5. Press "EOB" key to finish the setting of currently selected coordinate system, as axis Y in the figure below



3.6.3. Modify coordinate value

In addition to above two methods, you can also press the keypad to set the coordinate system in the following steps:

1. Press **坐标** **COORD** to enter the coordinate system interface.
2. Then, press **←+↻**, **→-↻** to select the coordinate system, e.g. G56.
3. Press **录入** **EDIT** to select the edit mode.
4. Press **↑+%**, **↓-%** to select a desired axis; to set Z axis of G56 to -10.5, press **↑+%**, **↓-%** to select axis Z, as shown in Fig. 4A, then, press **-**, **1**, **0**, **.**, **5** in sequence, and then press **EOB** to enter -10.5 to Z axis coordinate system, as shown in Fig. 4B.

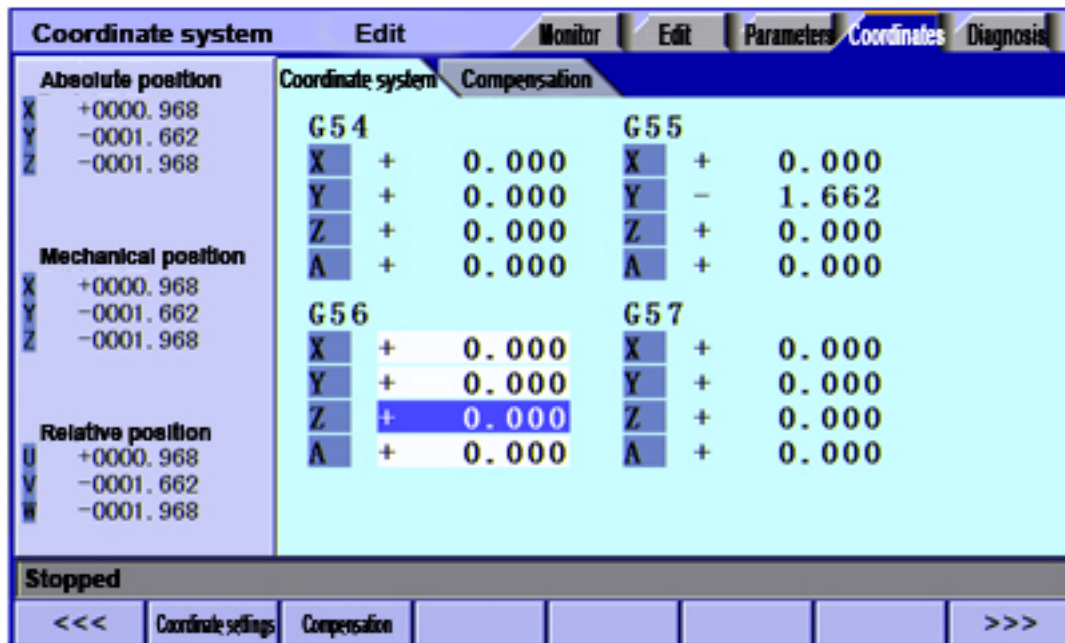


Fig. 4A

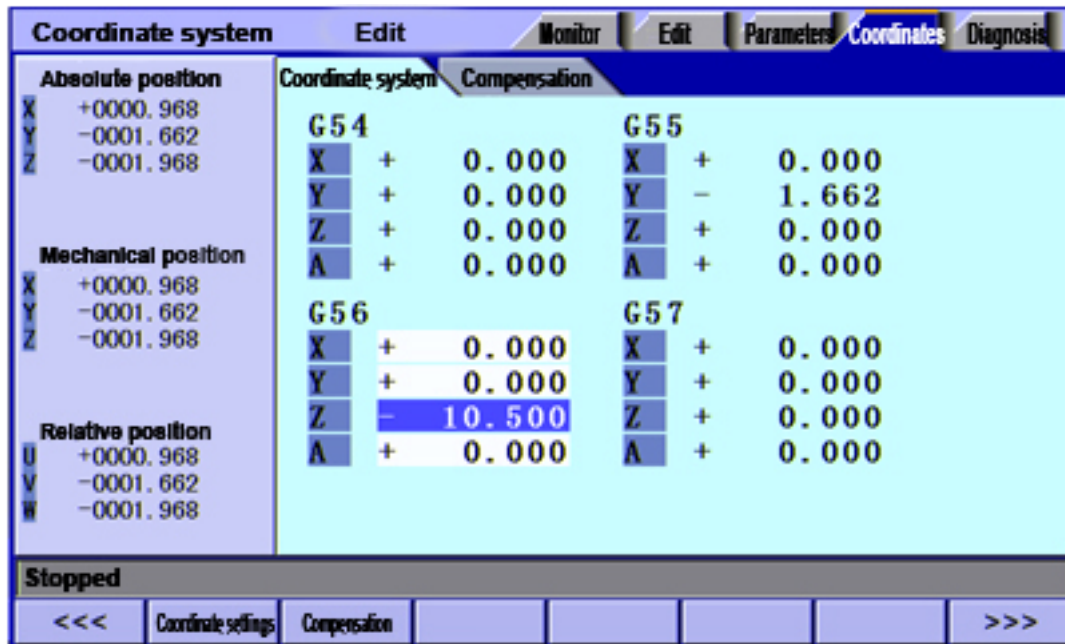


Fig. 4B

Edit other axes in the same method.

3.7 Data settings

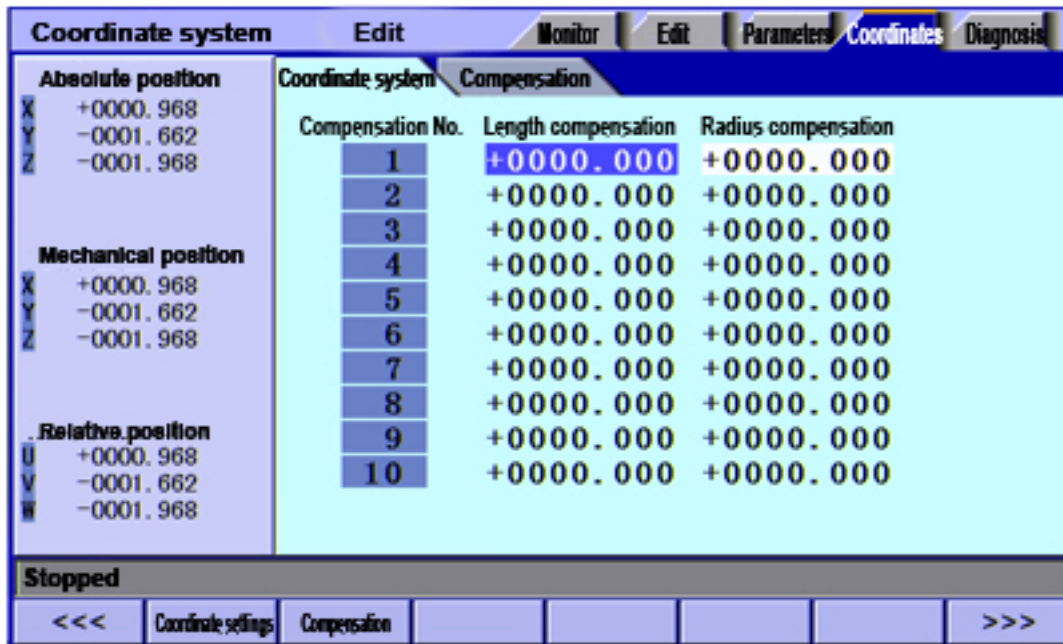
3.7.1. Tool compensation data setting

The tool compensation parameters can be set as follow:

✂ Press  to select the edit mode;

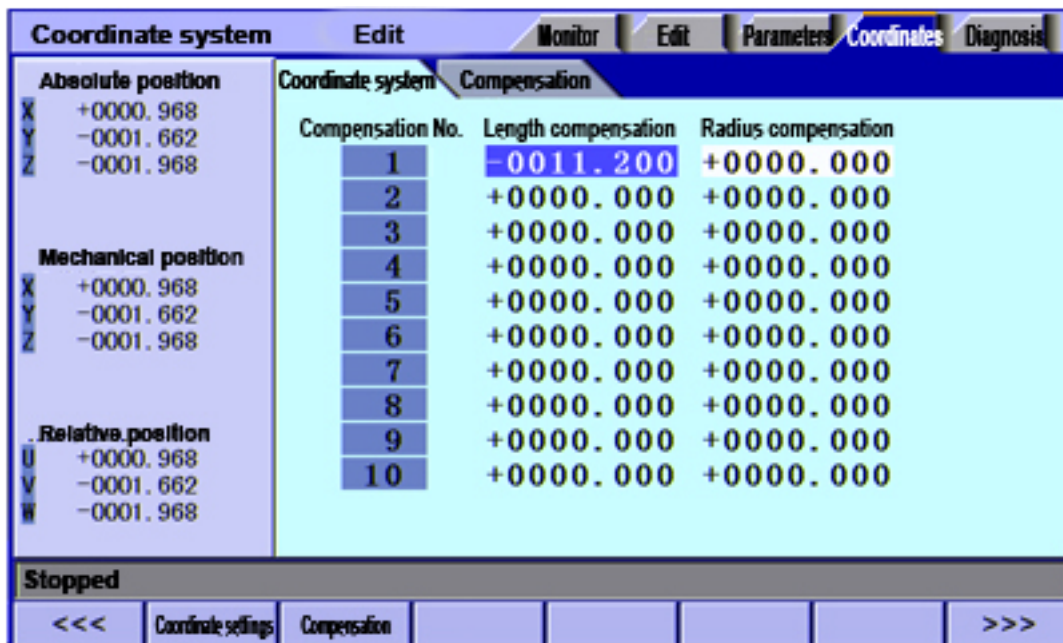
✂ In the main menu, press , and then press submenu [Compensation] to enter tool compensation parameter

setting interface;



Press / to select the parameter, e.g. compensation No. 1, enter -11.2 and press to modify

the parameters where the cursor is located, as shown in the figure below



Enter tool length compensation quickly: select compensation number, press and then press to insert Z

axis coordinates into length compensation, as shown in the figure below

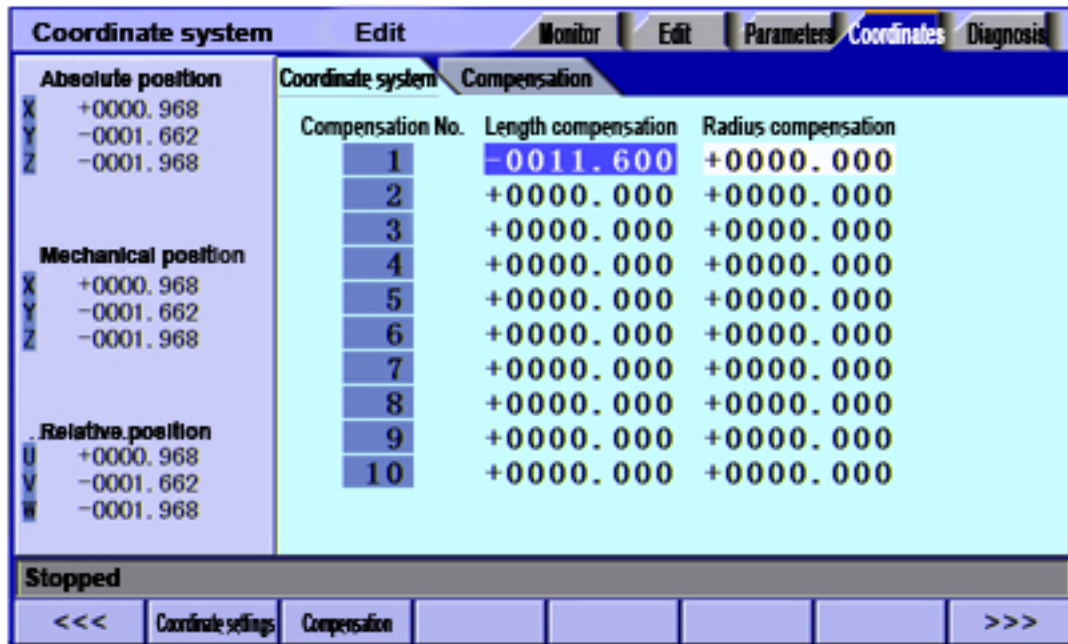
Compensation No.	Length compensation	Radius compensation
1	-0011.600	+0000.000
2	-0001.968	+0000.000
3	+0000.000	+0000.000
4	+0000.000	+0000.000
5	+0000.000	+0000.000
6	+0000.000	+0000.000
7	+0000.000	+0000.000
8	+0000.000	+0000.000
9	+0000.000	+0000.000
10	+0000.000	+0000.000

Caution

- ◆ The value entry dialog box has two input methods, i.e. direct assignment and increment assignment. For direct assignment, the entered value is assigned to specified parameter directly; for increment assignment, the entered value is added to specified parameter and then assigned to the parameter;
- ◆ The increment input box and direct input box have a prompt symbol in the left respectively, '=' indicates direct input, '+' indicates increment input, and the default mode is direct assignment. To change to increment assignment, press the "UP/DOWN" key
- ◆ The increment input is shown above, 1# compensation is -11.2, to add -0.4, the operation

follows: select 1# compensation, enter -0.4, and then press  /  to select the mode, "+" is to add the new value to original value, and "=" is to replace with the new value

 directly. Then, press  to finish the modification of the compensation, as shown below.



3.7.2. System parameter setting

The system parameters can be modified as follow:

✂ Press  to select the edit mode;

✂ In the main menu, press  to enter parameter setting interface;

✂ Then, press the submenu key to select the parameter type (comprehensive, management ...);

✂ Press , , ,  to move cursor to select the parameter, enter the value and then press  to modify the parameter where the cursor locates.

3.8 Fast system operation

The value entry dialog box has two input methods, i.e. direct assignment and increment assignment. For direct assignment, the entered value is assigned to specified parameter directly; for increment assignment, the entered value is added to specified parameter and then assigned to the parameter; the increment input box and direct input box have a prompt symbol in the left respectively, '=' indicates direct input, '+' indicates increment input, and the default mode is direct assignment. To change to

increment assignment, press the " / 

In [Monitor] interface, press  in the [Position] menu to call out G code O program number box to switch to O program block directly. Press  to confirm, or press  to return.

In [Monitor] interface, press  /  in the [Position] menu in manual mode to trim the main axis rotation; press and hold the key accumulate the rotation value directly. Note: This function can be operated only after the main axis is opened, and the current speed of the main axis shouldn't be 0; if the speed is 0, set a non-zero rotation in MDI mode, and then perform the operation.

In [Monitor] interface, press  /  in the [Position] menu in manual mode to adjust the manual magnification. In automatic mode, the automatic magnification is adjusted. Note: if additional panel is enabled, this operation will be covered by the magnification of the additional panel automatically, that is, this operation is invalid.

The machine tool moving according to prepared program is called as automatic operation. The automatic operation modes of DK300A system follow:

Memory operation, MDI operation, USB disk DNC operation

4. Automatic operation

4.1 Automatic operation

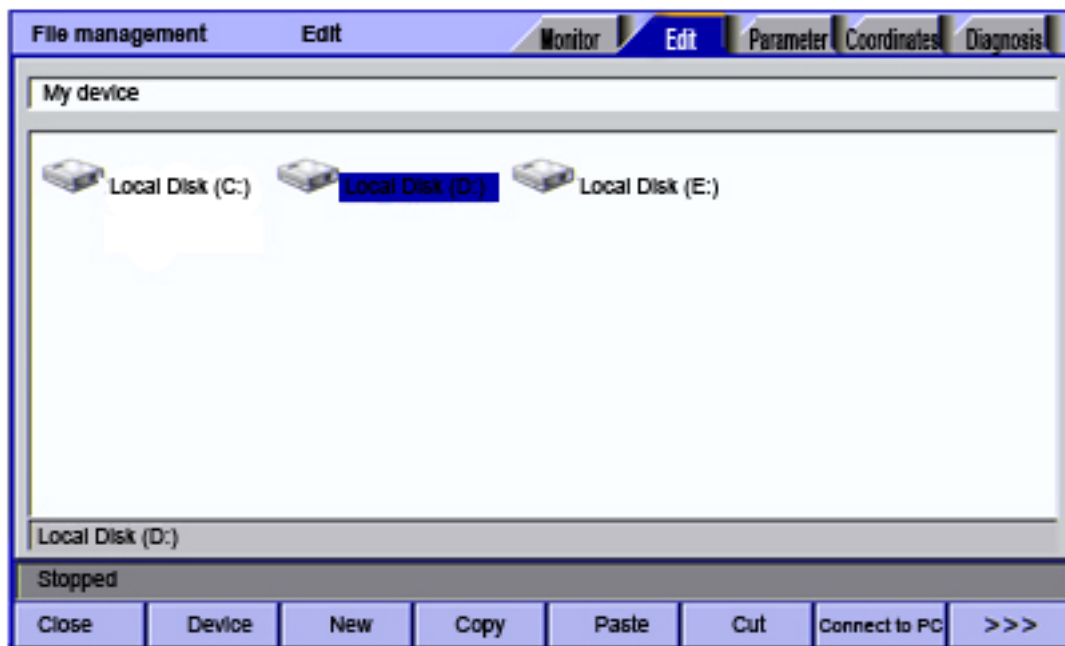
The machine tool can operate according to the program in DK300A memory, which is called as memory operation.

The program is prestored in the memory. Select and load a program with the operation panel and press

the “” key to start the automatic operation. Then, press “” key to pause, press “” key again to resume the operation, and press “” during operation to stop the program immediately.

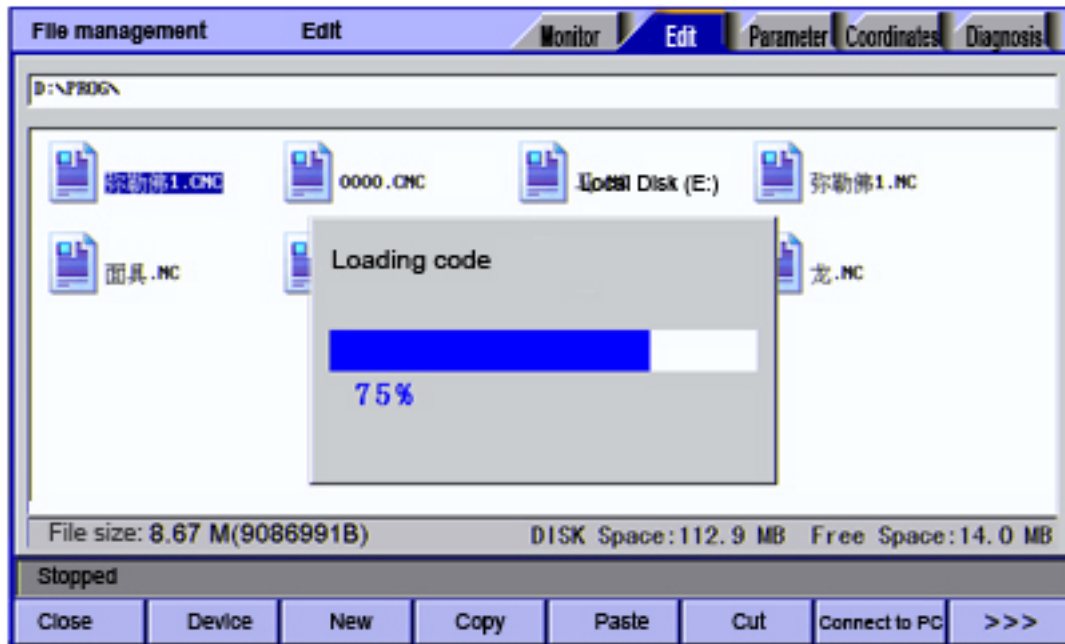
The step of memory operation follows:

- (2) Save the program in the memory (see section 8.1 for details);
- (3) Select [Edit], [File] in the menu or press [File] on the panel to enter file operation interface;



Disk C is YAFS file system disk, which is dedicated system disk. Disk D is FAT data disk, which saves processing files and system settings as well as PC interactive data. Removable USB disk saves external user data.

- (4) Press , , ,  to move the cursor, press [,] to select a program and load the file into the work area; as shown in the figure below



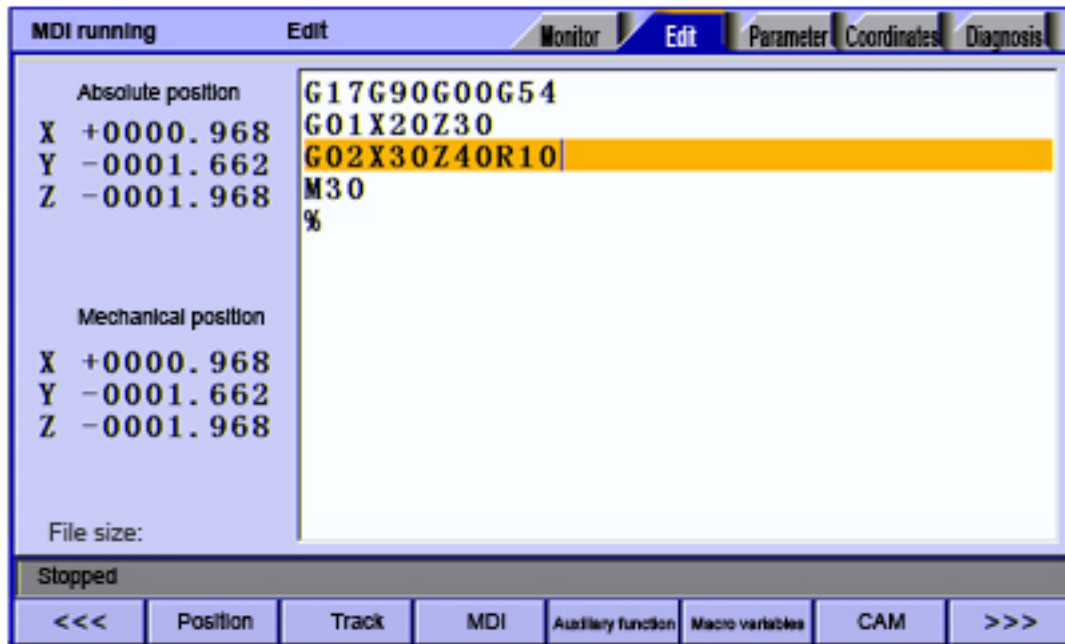
(5) Press mode selection key [] to switch to automatic mode;

(6) Press the [] key to run the program, and the indicator is on.

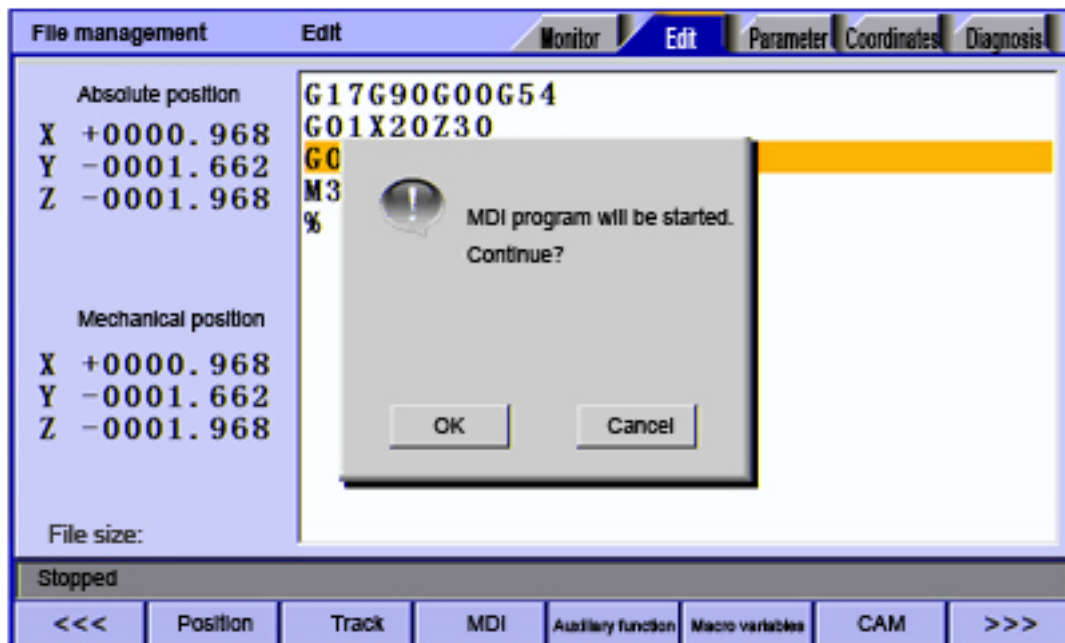
4.2 MDI operation

In [Monitor] interface, switch to [MDI], enter the program with keypad and make the machine tool operate according to the program. The program block isn't saved in system memory, and can't be preserved upon power failure. This is called as MDI operation and the step follows:

- (1) Press mode selection key [Edit];
- (3) Select [Monitor], [MDI] in the menu to enter MDI interface;
- (4) Enter program block instruction manually;



(5) Press [Start], [EOB] to start executing the program block, as shown below.



4.3 USB disk DNC

The program read from external USB disk can operate the machine tool without saving in CNC memory. This operation is called as USB disk DNC operation.

The step of USB disk DNC operation follows:

- (1) Insert the USB disk;
- (2) Select [Monitor], [File] in the menu to enter file operation interface;

- (3) Select USB disk and press [EOB] to enter;
- (4) Move cursor to select a file in the disk;
- (5) Press [EOB] to load the file into work area (system buffer);
- (6) Press mode selection key [Auto];
- (7) Press the [Start] key to run the program, and the indicator is on.

 Caution

The system won't record the USD disk path. If power failure occurs during DNC processing, the program info will be lost when the power supply is connected again.

4.4 Speed rate adjustment

Feeding rate

In automatic mode, press  /  key in [Position] interface to adjust the feeding rate; Press the key once to increase or decrease by 10% (10%-150%).

Manual rate

In manual mode, press  /  key in [Position] interface to adjust the manual rate; Press the  key and  /  key, you can adjust the fast forward rate by 10% (10%-150%).

Principal axis rotation

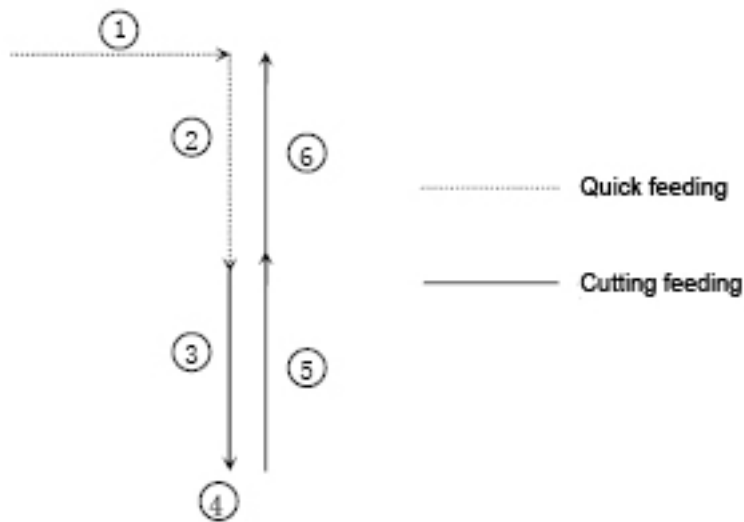
In automatic or manual mode, press the  /  key to adjust the principal axis rotation by 100r/min. The maximum rotation is set by the principal axis parameters in the system and the minimum rotation is 16r/min. If you press and hold the key for three seconds, the value will be increased or decreased quickly.

4.5 SBK function

In automatic mode, press [] to start the SBK function. Current program block stops after executing; press [] again and next block stops after executing. The SBK mode allows checking the program block by block.

Caution:

- ① In G28-G30, single block also can be stopped at the center point;
- ② The stop points of single block in fixed circle are ①, ②, ⑥ in the figure below; when the single blocks of ①, ② stops, the feeding pauses and the pause indicator is on.



4.6 BDT function

In automatic mode, press [] to start the BDT function, which will make the block instructions in the line after '/' in the program invalid.

4.7 Stopping automatic operating

Two methods are available to stop automatic operating, i.e. enter stop command where the program will

stop (M00, M01) and press the  key on the operation panel to stop the machine tool.

Program stops

After executing the block with M00 or M01, the automatic operating stops, which is same to single block stop, and all mode information is saved. Start with CNC and the automatic operation can be started again.

After processing a part, the automatic operation stops.

Program ends

After executing the block with M30, the automatic operating stops, changes into reset state, and returns to program start.

Feeding pause

During automatic operation, press the  key on the operation panel, the automatic operation pauses and the indicator is on; press  again to continue operating the machine tool and the pause indicator is on.

Reset

During automatic operation, press the  key on the operation panel and the system stops immediately. Here,  has the same function as emergency stop button.

5. Safe operation

5.1 Emergency stop

Press the emergency stop button on the machine tool, which will stop immediately, and all outputs such as principal axis rotation and coolant are turned off. Rotate the button clockwise to cancel emergency stop, but all outputs must be restarted.

Caution:

The power supply isn't always cut off upon emergency stop. Please refer to the electrical configuration description of the machine tool manufacturer for details;

Before releasing emergency stop, please eliminate the problems of the machine tool.

5.2 Hard limit over travel

The system alarms if the tool touches travel switch during operation. The axis in corresponding direction can't move, and only moves in reverse direction. Before the alarm is released, the system can't enter automatic operation normally. After investigating the alarm reason, press [] to clear the alarm information.

5.3 Soft limit over travel

If the tool enters the restriction area regulated by the parameter (travel limit), the system alarms over travel, and the tool decelerates and stops. At this moment, you can move the tool to safe direction in manual mode, and then press [] to release the alarm.



Caution:

During automatic operation, when the tool touches an axial travel switch, the tool decelerates and stops all axial motions, and only displays one over travel alarm.

During manual operation, when the tool touches an axial travel switch, the tool only decelerates and stops motion on current axis, and still moves along other axes.

When the tool is in safe position, press [Reset] to clear the alarm. Please refer to the manual of the machine tool for details.

Both limit alarm and soft limit alarm have a deceleration stop, and therefore the sensing range of the limit should have sufficient space, or else the limit protection will be disabled due to over travel.

6. Alarm and self- diagnosis function

The system has several levels, and the alarm numbers also have different type, as follow:

0~1023: G code program running alarm info

1024~2048: System environment alarm info

6.1 NC program execution alarm

0000	:	Reset
0001	:	Prog No End

0004	:	M6Tx Abort
0005	:	Tool Invalid
0006	:	G Program Repeat Error
0007	:	G Program Number Error
0008	:	G7X8X Instruction Run Error
0009	:	Program Abend
0010	:	Appointed M01 Instruction Stop
0011	:	M98 Format Error
0012	:	Motion Run Error
0013	:	Current Program No Repair
0014	:	G Program Format Error
0015	:	M99 Instruction Abort
0016	:	Motion Abort
0017	:	Illegal char
0018	:	Noneffective Exegesis Character
0019	:	Illegal G Code
0020	:	GCode RadialOffset Num Err
0021	:	Noneffective GCode RadialOffset
0022	:	Arc Appointed Error
0023	:	Appointed Noneffective Plane
0024	:	M98 Instruction Abort

0025	:	Spindle Appointed Number Error
0026	:	MCode Instruction Abort
0027	:	Spi Appointed Err
0028	:	Motion Repeat Request
0029	:	Appointed Arc Nonentity
0030	:	Missing X Code Error
0031	:	Missing X Code Error
0032	:	Missing X Code Error
0033	:	Missing X Code Error
0034	:	Missing X Code Error
0035	:	Missing X Code Error
0036	:	Missing X Code Error
0037	:	Missing X Code Error
0038	:	Missing X Code Error
0039	:	Missing X Code Error
0040	:	Missing X Code Error
0041	:	Missing X Code Error
0042	:	Missing X Code Error
0043	:	Missing X Code Error
0044	:	Missing X Code Error
0045	:	Missing X Code Error

0046	:	Missing X Code Error
0047	:	Missing X Code Error
0048	:	Screw Value Repeat Error
0049	:	System Abort
0050	:	Factitious return
0051	:	no parameter input
0052	:	no store address for Gcode pro num form

6.2 System environment alarm

1024	:	no \ "return zero\
------	---	--------------------

1. The system doesn't perform home action after started

1025	:	4 - direction program limit
1026	:	4 + direction program limit
1027	:	Z - direction program limit
1028	:	Z + direction program limit
1029	:	Y - direction program limit
1030	:	Y + direction program limit
1031	:	X - direction program limit
1032	:	X+ direction program limit
1033	:	4 - direction machine limit
1034	:	4 + direction machine limit

1035	:	Z - direction machine limit
1036	:	Z + direction machine limit
1037	:	Y - direction machine limit
1038	:	Y + direction machine limit
1039	:	X - direction machine limit
1040	:	X+ direction machine limit

The system has corresponding limit alarm. Please check corresponding limit sensor point or parameters.

If hard limit occurs, and the appearance of the sensor point doesn't have any problem, enter the diagnosis mode in manual mode and check the state of the input port in diagnosis mode. If the state is valid, please eliminate in sequence. Pull out the input IO cable and check whether the sense disappears. If yes, please check the circuit. If the problem still exists, the internal optocoupler is broken. Please contact the supplier.

1041	:	Emergency stop
------	---	----------------

Emergency stop button of the handheld box interface is valid.

External emergency stop 2 input is valid; check whether IO assignment has conflict or interference.

Search for corresponding function ports in IO configuration, and then check in input diagnosis.

1042	:	X Servo driver alarm
1043	:	Y Servo driver alarm
1044	:	Z Servo driver alarm
1045	:	4 Servo driver alarm

Servo alarm; if the servo doesn't alarm, parameter P2.001~004 setting and actual servo alarm level may be reverse. Please modify the parameters.

The corresponding function ports are IN34~37, which can be checked in input diagnosis.

1046	:	Axis's physical line redefine
------	---	-------------------------------

Interface axis No. set by parameter P2.45~P2.49 is specified repeatedly

1047	:	spi no to home
1048	:	workpiece no lock
1049	:	safe signal can't detect
1051	:	air no enough
1052	:	chuck signal alarm detect

6.3 Alarm processing

If alarm occurs, please refer to the alarm code to confirm the failure reason.

When alarm occurs, if the system isn't reset, the alarm will constantly prompt no matter whether the alarm still exists, so as to avoid the conditions that false alarm causes system suspended, but can't find the reason.

If the error is caused by data setting, modify the data, and then press [Reset] to clear the alarm info.

When alarm occurs, please remove the alarm reason. Please note that several alarms may occur at the same time. Please refer to the alarm info in the Diagnosis menu for details. When the alarms are eliminated, please press [Reset] to clear the alarm ring.

6.4 Self-diagnosis function

The CNC system may stop even when there is no alarm info, this may be because the system is executing certain processes. Please check with the self-diagnosis function.

The step of self-diagnosis follows:

- (1) In the main menu, press [Diagnosis] to enter the diagnosis interface;
- (2) Select [Input] to enter the input diagnosis interface, or select [Output] to enter the output diagnosis interface;
- (3) Output diagnosis: In edit mode, press the direction keys to select the output port, and press [EOB] to switch the output level of corresponding output port;
- (4) Input diagnosis: When certain input signal is valid, the corresponding area on the screen flashes.

7. Program saving & editing

7.1 Saving the program in the memory

7.1.1. Keypad input (new program)

Create new program in the memory with the keypad, and the step follows:

In the main menu, press [Edit] to enter program edit interface;

Press [File] to enter file operation interface;

Select [New] to create a new file;

Enter the file name and press [EOB] to confirm and create a new program in current directory in the memory, and load into the system by default;

Select [Close] to exit [Edit] interface;

In edit mode, enter the program content;

After editing all programs, press [Reset] to save the edited programs into the system memory.

7.1.2. PC serial port input

The step of transmitting files to controller through PC follows:

Set system baud rate and ID No.;

Connect to PC and run Adtech serial communication software;

Set the baud rate same as controller, and scan ID device;

Select the [Upload file to NC] button in the communication software;

Select CNC file in the popup dialog box and press [Open] button.

7.1.3. Copying processing files from USB disk

The step of copying CNC processing file to system memory through USB disk follows:

In the main menu, press [Edit] to enter program edit interface;

Press [File] to enter file operation interface;

Select USB disk and press [EOB] to enter;

Move the cursor to select a CNC file and then select [Copy];

Return to the root directory, locate the PROG directory in disk D, enter the directory, and select [Paste] to complete copying.

7.2 Reading programs into work area

7.2.1. Reading programs from controller into work area

The step of loading files from system memory into work area follows:

Press [File] to enter file operation interface;

Select desired program, which is in PROG directory in disk D by default, press [EOB] to enter subdirectory, or press [Cancel] to exit;

Move cursor to select desired program, press [EOB] to confirm and load the program.

7.2.2. Reading programs from USB disk into work area

The step of loading files from USB disk into work area follows:

Insert the USB disk;

Press [File] to enter file operation interface;

Select USB disk, move cursor to select a file in the disk, and press [EOB] to load the file.

7.3 Editing & modifying programs

The program in CNC memory can be edited with NC keypad. In the main menu, press [Edit] to enter program edit interface and edit the program in current work area (for loading program into work area, refer to section 8.2). The edit mode is similar to notepad in Windows. Move the cursor directly to locate, press keys to enter, press [EOB] to change line, and press [Delete] to delete the character where the cursor locates.



After all operations, press Reset to save the files, and the functions base on edit mode;

DK300A uses new file mapping technology, and allows loading processing files that exceed its memory. Therefore, to ensure the system efficiency, you can only search and process, but can't edit the processing files that exceed 2MB.

7.4 Deleting files

7.4.1. Deleting files in memory

Follow the step below to delete the programs in system memory:

Press [File] to enter file operation interface;

Follow the prompt on the screen, select the file and press [Delete] to confirm and delete the file.



If the program has been loaded into work area, you need to restart the system to delete the program, or else the system will report error.

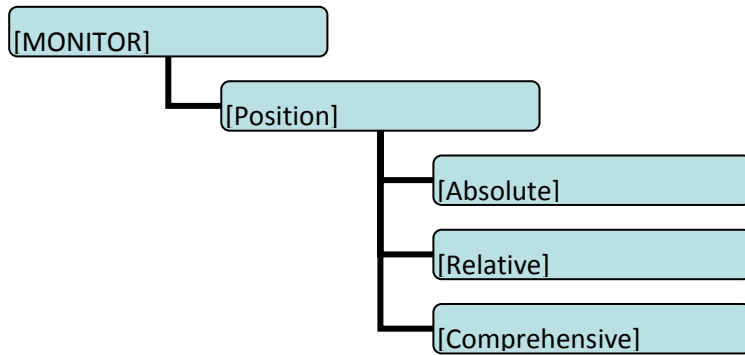
The programs loaded into the work area can't be deleted, or else the system will report error.

8. Main interfaces of the system

8.1. Position interface

The position interface shows current machine tool coordinates, including absolute position, relative position and comprehensive position. In the main interface, press [Monitor] to enter the position interface.

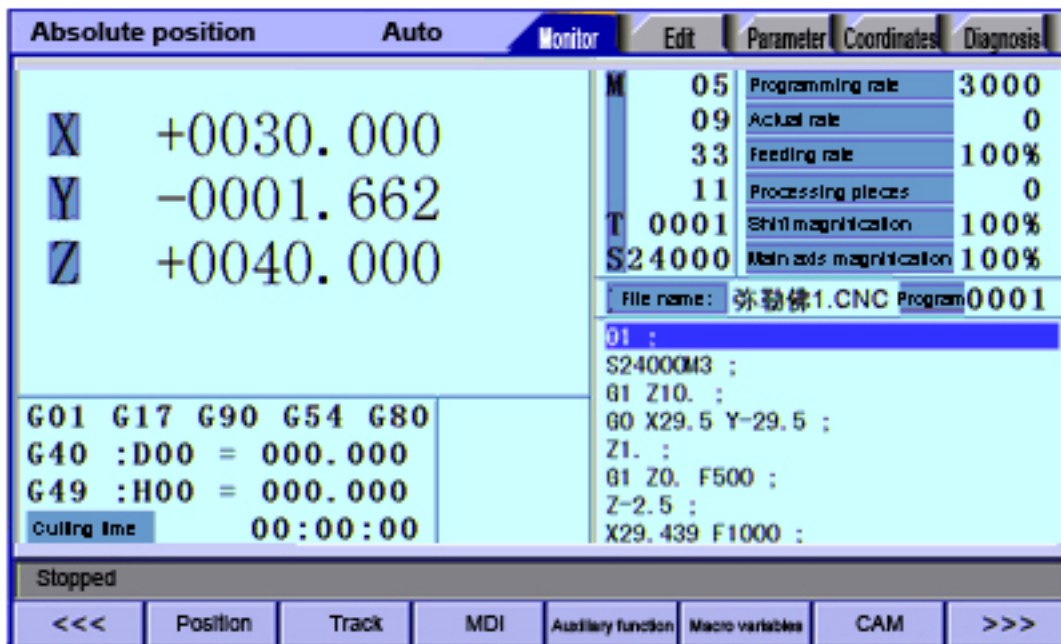
To enter position interface:



8.1.1. Absolute position

The position of current machine tool coordinates relative to the origin of workpiece coordinate system.

The absolute position interface follows:



Absolute Position Interface

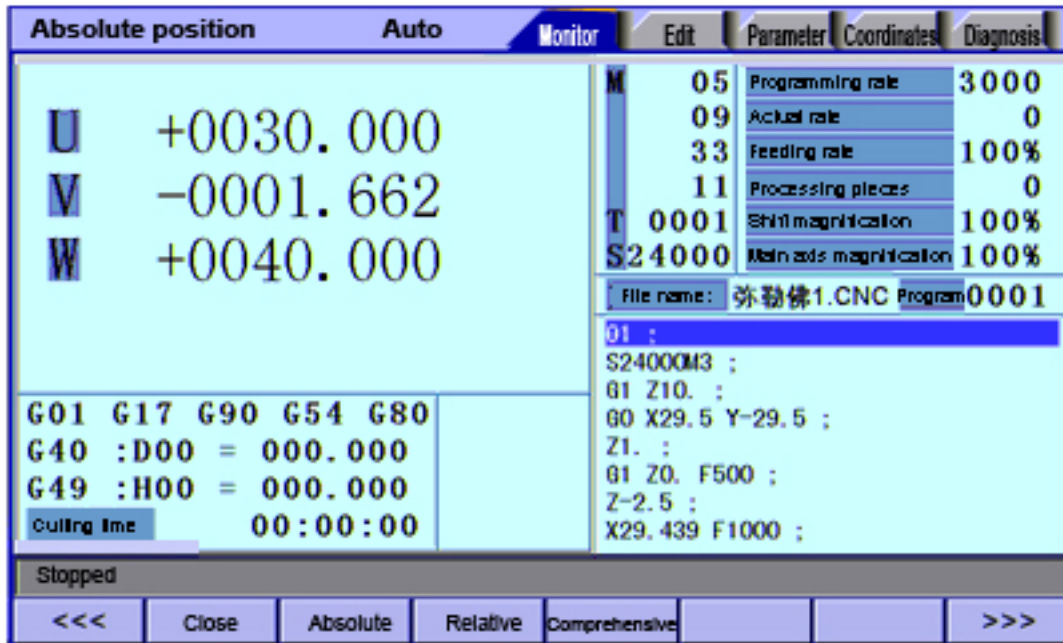
8.1.2. Relative position

In manual mode, reset current coordinates to check the relative motion distance of any displacement, and thus it is called as relative position.

This interface is usually used for early tool setting. Considering that some operators have been used to manual calculation, this function is preserved. With the more and more powerful of automatic centered function, it is used less.

The operation follows:

- ✂ Enter [Position] interface; Switch to [Relative] interface; Then, enter manual mode; Press a coordinate axis No., e.g., 'X', and the X coordinate flashes; Press "Cancel" to reset X coordinate to 0; The relative position interface follows:

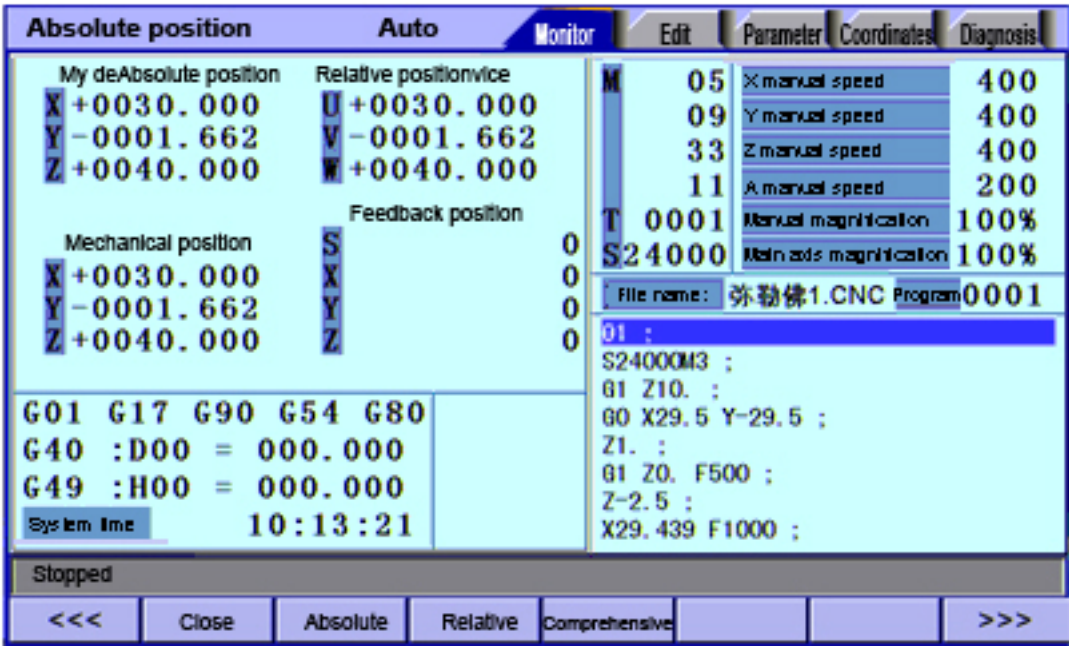


Relative Position Interface

8.1.3. Comprehensive coordinates

The interface displayed by absolute coordinates and machine tool coordinates.

Comprehensive position interface is shown below:

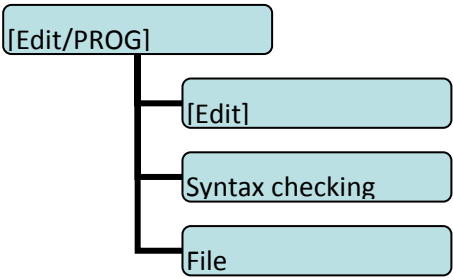


Comprehensive Position Interface

8.2. Edit interface

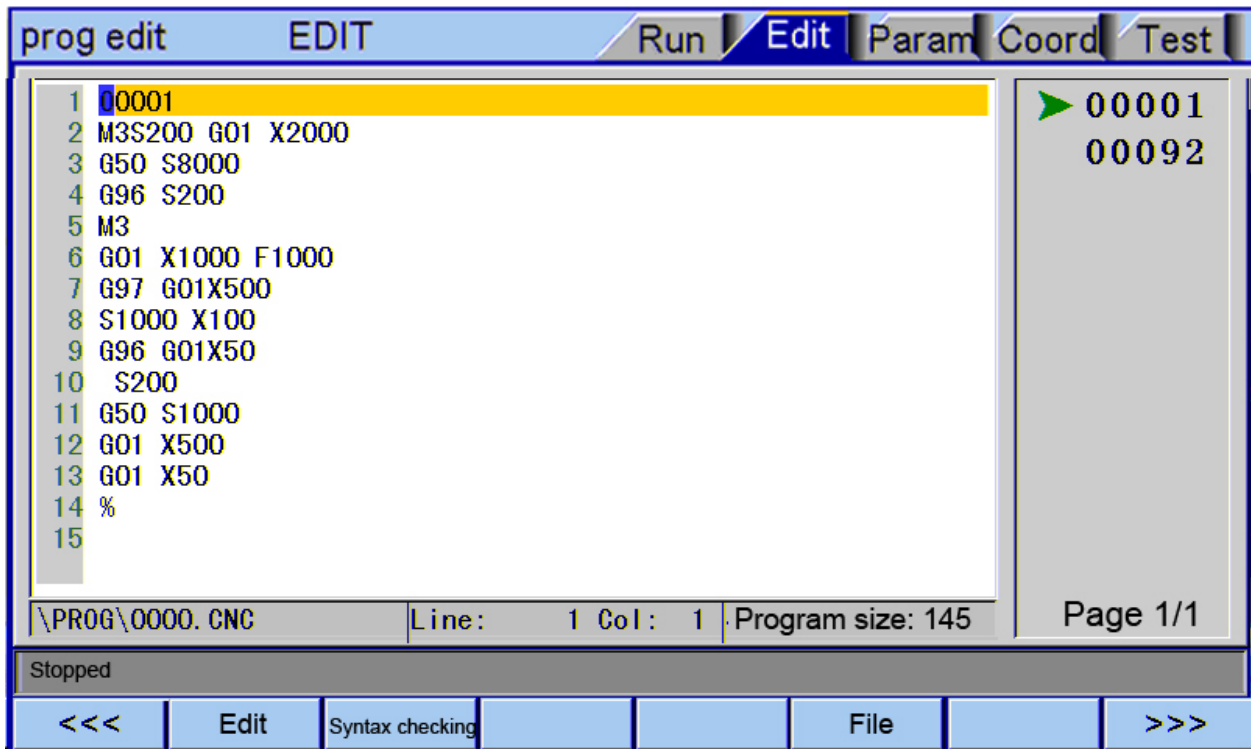
The edit interface shows the program info in current work area. In the main interface, press [] to enter the program interface.

To enter program edit interface:



8.3. Program edit

The program edit interface shows the NC program currently processed; in edit mode, you can edit the NC program (see section 8.3 for details).

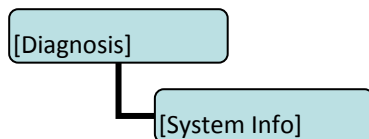


Program Edit Interface

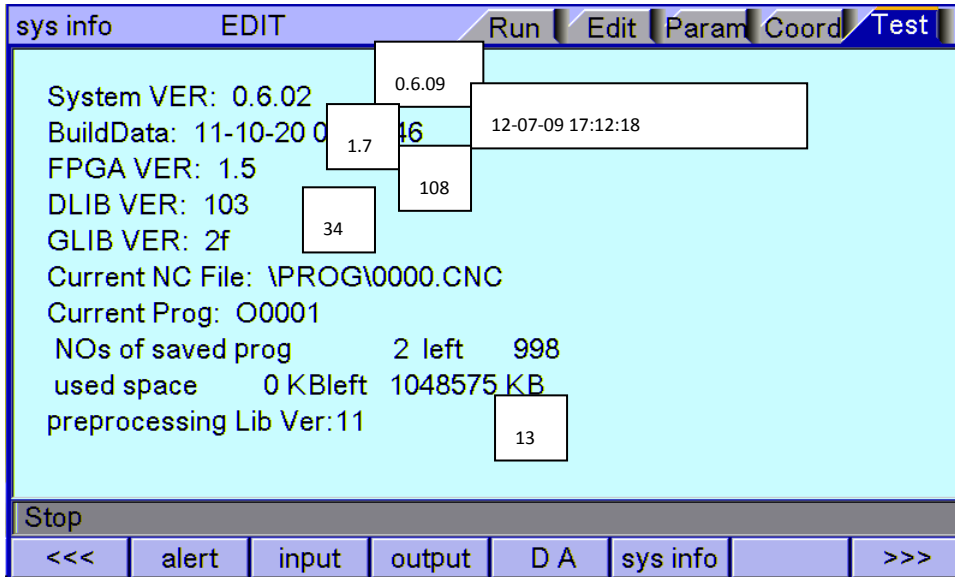
8.4. System Info Interface

The system info is a summary of the program blocks in current processing area, and calculates the resource usage in current work area. The upper right of the program directory interface shows the version info of current controller software. If our engineering personnel ask to confirm the software version of the controller on site, please provide this version info.

To enter system info interface:



System info interface is shown below:

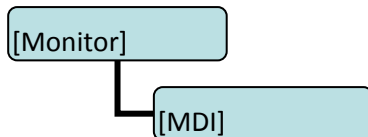


System Info Interface

8.5. MDI interface

MDI mode is mainly used for the execution of single G code in certain occasions.

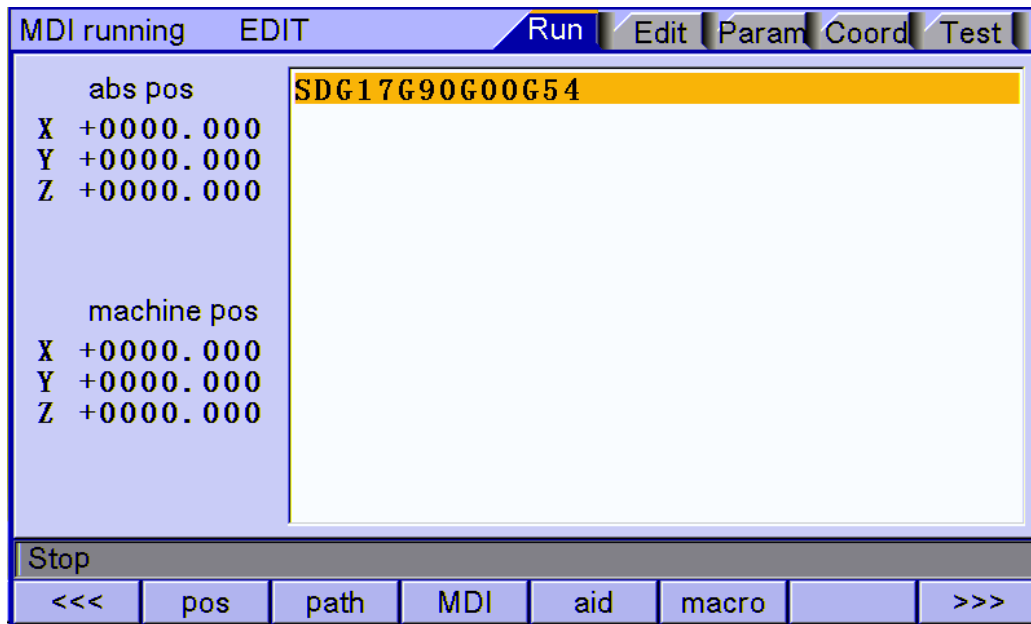
To enter MDI interface:



In MDI interface, enter complete NC code instruction in edit mode, press the [Start] key in the edit mode and confirm to execute directly.

To restore the default settings quickly, press and hold the [Reset] key for three seconds and choose to reset or not.

MDI interaction interface is shown below:

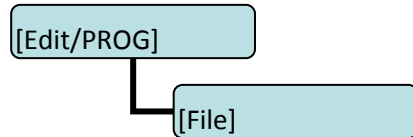


MDI Interface

8.6. File management

In the file management interface, you can manage the system files.

To enter file management interface:



File management mainly has the following functions:

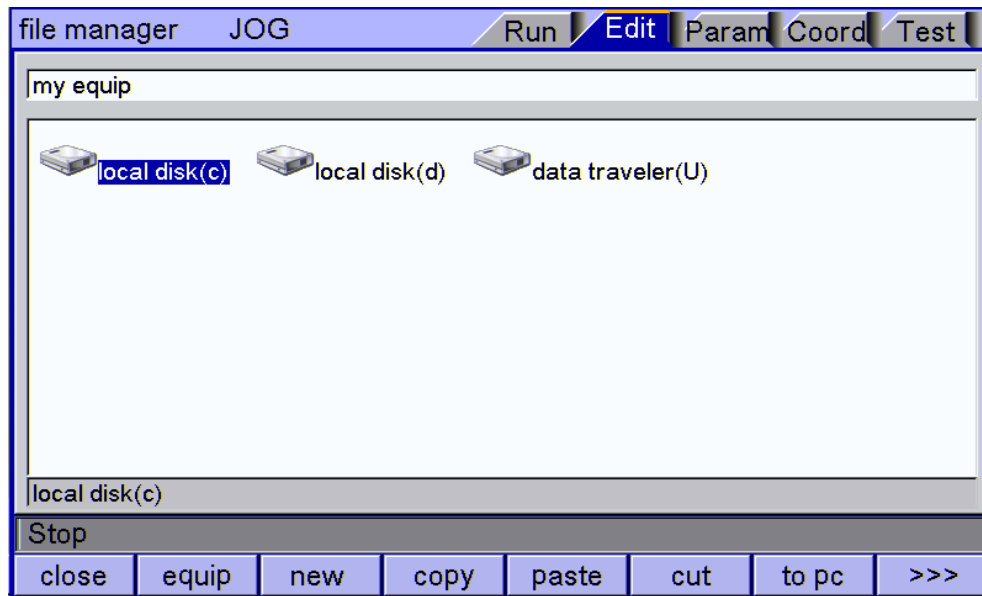
Connect the UBS disk, and copy the files between USB disk and electronic disk;

Upgrade system software: Copy the upgrade file to system memory in either method above to upgrade the software;

Restart the controller. In [File Management] interface, press the Reset key to restart the controller. This method is different from restarting due to power failure. In certain occasions, you can restart the controller quickly in this method to make certain function take effect.

Connect to PC with the USB cable, and exchange the data between USB disk and PC.

File operation interface is shown below:

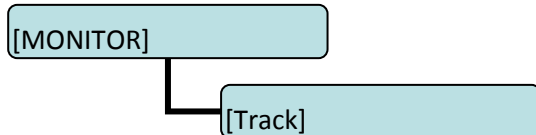


File Operation Interface

8.7. Graphic simulation

[Track] function is to simulate NC processing program.

To enter graphic simulation interface:



Enter track interface to enable real-time track display automatically. During automatic running of the system, the motion track is displayed in real-time. In standby mode, you can also press Preview to prescan the processing file.

The shortcuts of adjusting position:



: Zoom in

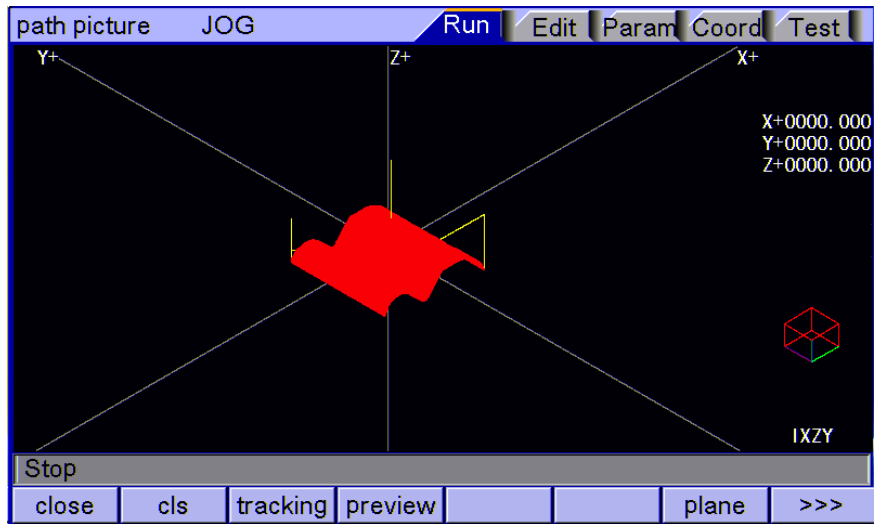


: Zoom out



: Shift position; the shift unit is the set pixel unit

Graphic simulation interface is shown below:

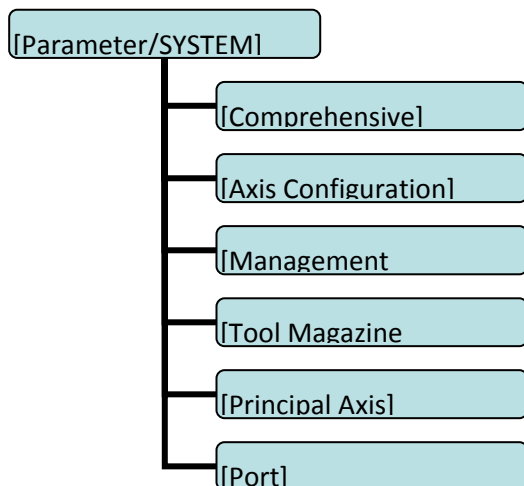


Graphic Simulation Interface

8.8. Parameter interface

The parameter interface shows system parameter info, including comprehensive, axis parameter, management, tool magazine, principal axis, port, etc. In the main interface, press [parameter] to enter the interface.

Parameter has the following menus:



General parameters

General parameters are a set of functions that aren't classified in details, e.g. home mode, manual speed, etc.

General parameter interface is shown below:

general		JOG	Run	Edit	Param	Coord	Test
001 X Gear Numerator	1	013,XStartupSpeed(mm/min)	100				
002 X Gear Denominator	1	014,YStartupSpeed(mm/min)	100				
003 Y Gear Numerator	1	015,ZStartupSpeed(mm/min)	100				
004 Y Gear Denominator	1	016,4StartupSpeed(mm/min)	100				
005 Z Gear Numerator	1	017,X Acceleration(Kpps)	1000				
006,Z Gear Denominator	1	018,Y Acceleration(Kpps)	1000				
007,4 Gear Numerator	1	019,Z Acceleration(Kpps)	1000				
008,4 Gear Denominator	1	020,4 Acceleration(Kpps)	1000				
009,X FastSpeed(mm/min)	3000	021,X Soft PosLimit+(mm)	+ 9999.999				
010,Y FastSpeed(mm/min)	3000	022,X Soft PosLimit-(mm)	- 9999.999				
011,Z FastSpeed(mm/min)	3000	023,Y Soft PosLimit+(mm)	+ 9999.999				
012,4 FastSpeed(mm/min)	3000	024,Y Soft PosLimit-(mm)	- 9999.999				
Stop							
<<< genl axis manage tools spindle port >>>							

General parameter Interface

Axis parameters

Axis parameters are parameter set of interface characteristics of control position axis. Please refer to the parameter description for details.

Axis parameter interface is shown below:

axis		JOG	Run	Edit	Param	Coord	Test
001,X_ServoAlarmIn ELevel	0	013,Z_ECZ Home Enable	0				
002,Y_ServoAlarmIn ELevel	0	014,Z_ECZ Home ELevel	0				
003,Z_ServoAlarmIn ELevel	0	015,4_ECZ Home Enable	0				
004,A_ServoAlarmIn ELevel	0	016,4_ECZ Home ELevel	0				
005,X_ServoResetOut ELevel	1	017,X Limit+ Enable<●>	0				
006,Y_ServoResetOut ELevel	1	018,X Limit- Enable<●>	0				
007,Z_ServoResetOut ELevel	1	019,X Limit ELevel<●>	0				
008,A_ServoResetOut ELevel	1	020,Y Limit+ Enable<●>	0				
009,X_ECZ Home Enable	0	021,Y Limit- Enable<●>	0				
010,X_ECZ Home ELevel	0	022,Y Limit ELevel<●>	0				
011,Y_ECZ Home Enable	0	023,Z Limit+ Enable<●>	0				
012,Y_ECZ Home ELevel	0	024,Z Limit- Enable<●>	0				
Stop							
<<< genl axis manage tools spindle port >>>							

Axis Parameter interface

Management parameters

This is a function set that confirms identity and initialize the system.

Management parameter interface is shown below:

manage		JOG	Run	Edit	Param	Coord	Test
001,Select SupMode	Superuser	013,lead in CSV sys config	=====				
002,AlterSuperuserPasswor	*****	014, startup display module	ReI				
003,Alter User Password	*****	015,sys language bag	Engl ish				
004,Initialize	=====	016,macro key word valid En	OFF				
005,Initialize IO Config	=====	017,startup picture display	1s				
006,all para reset<•>	=====	018,sys display axis setting	XYZ				
007,para backup	=====	019,sys debug information En	ON				
008,para recover	=====	020,axis control composite key	ON				
009,generate cryptogram	=====	021,additional panel enable	OFF				
010,menu click way	=====	022,Select M macro program <•>	MFUNC (M)				
011,clear add up work num	=====	023,Select T macro program <•>	TFUNC (M)				
012,clear current work num	=====	024,Select PLC macro program <•>	PLC (M)				
Stop <<< genl axis manage tools spindle port >>>							

Management Parameter Interface

Tool magazine parameters

Tool magazine parameters collect the parameters that the tool magazine requires. The specific meaning of the parameters should be determined by the tool magazine of the machine tool, and therefore should refer to the instructions provided by the machine tool manufacturer.

Principal axis parameters

Principal axis parameters are the set of electrical characteristics of servo and common principal axes. The specific application also depends on the principal axis selection of the machine tool manufacturer. The servo parameters and axis parameters have the same meaning, and therefore please refer to the description of axis parameters.

Principal axis parameter interface is shown below:

spindle		JOG	Run	Edit	Param	Coord	Test
001, Spi.Alarm ELevel	1	013, Spi.Encode bits(p)	0				
002, Spi.Reset ELevel	1	014, Spi.ZeroOffset(p)	0				
003, Spi.ECZ Home Enable	1	015, Spi.PulseLogic Level	0				
004, Spi.ECZ Elevel	0	016, Spi.Rolling Display Usage	0				
005, Spi. Limit+ Enable	0	017, Spi.Max Acc(Kpps)	2000				
006, Spi. Limit- Enable	0	018, Spi.Ext HomeDir	0				
007, Spi.Limit Elevel	0	019, Spi.Servo HomeDir	0				
008, Spi.Pulse Mode	1	020, Spi.Max Speed(rpm)	24000				
009, Spi.Pulse Logic Mode	1	021, Spi.Home Speed(rpm)	1000				
010, Spi.HomeDect ELevel	0	022, Spi.Gear Numerator	1				
011, Spi.ExtHome Check En	1	023, Spi.Gear Denominator	1				
012, Spi.Round Setting	0	024, Spi.Encoder Logic Dir	0				
Stop							
<<<	genl	axis	manage	tools	spindle	port	>>>

Principal Axis Parameter interface

IO configuration parameters

IO configuration parameters are the assignment of hardware interfaces. This parameter set is the IO pin sequence specified by the system's IO function numbers, which will improve the system flexibility. Please refer to System Parameters for the specific meaning of the parameters.

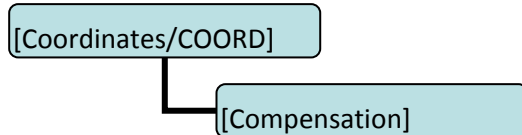
IO configuration parameter interface is shown below:

IO para		JOG	Run	Edit	Param	Coord	Test
001, Wheel0.1	24	013, Z Alarm	36				
002, Wheel0.01	26	014, 4 Alarm	37				
003, Wheel0.001	28	015, IN0-----wire No:(1-24)	1				
004, X Wheel	25	016, IN1-----wire No:(1-24)	2				
005, Y Wheel	27	017, IN2-----wire No:(1-24)	3				
006, Z Wheel	29	018, IN3-----wire No:(1-24)	4				
007, A Wheel	31	019, IN4-----wire No:(1-24)	5				
008, SCRAM	33	020, IN5-----wire No:(1-24)	6				
009, STOP	32	021, IN6-----wire No:(1-24)	7				
010, STARTUP	30	022, IN7-----wire No:(1-24)	8				
011, X Alarm	34	023, IN8-----wire No:(1-24)	9				
012, Y Alarm	35	024, IN9-----wire No:(1-24)	10				
Stop							
<<<	genl	axis	manage	tools	spindle	port	>>>

8.9. Compensation interface

Tool compensation interface shows tool compensation info of the system, including tool length compensation, tool radius compensation and other input variables. The compensation method is described below.

To enter tool compensation interface:



M series tool compensation interface has two compensation variables, i.e. tool length compensation and tool radius compensation; corresponding to G43, G44 and G41, G42; enter compensation value to corresponding compensation number, and transfer the compensation number in NC program to realize the compensation. Tool compensation numbers have 36 variables.

Tool compensation interface is shown below:

Coord		EDIT		Run	Edit	Param	Coord	Test
		Coord	Exp	Set	Halve	T Cut	Test	
abs pos								
X	+0000.000							
Y	+0000.000							
Z	+0000.000							
machine pos								
X	+0000.000							
Y	+0000.000							
Z	+0000.000							
rel pos								
X	+0000.000							
Y	+0000.000							
Z	+0000.000							
		offset	No length	offset	R offset			
		1	+0000.000		+0000.000			
		2	+0000.000		+0000.000			
		3	+0000.000		+0000.000			
		4	+0000.000		+0000.000			
		5	+0000.000		+0000.000			
		6	+0000.000		+0000.000			
		7	+0000.000		+0000.000			
		8	+0000.000		+0000.000			
		9	+0000.000		+0000.000			
		10	+0000.000		+0000.000			
Stop								
<<<		Coord	Expiate	Set	HALVE	TCheck	Measure	>>>

Tool Compensation Parameter Setting Interface

8.10. Workpiece coordinate system setting interface

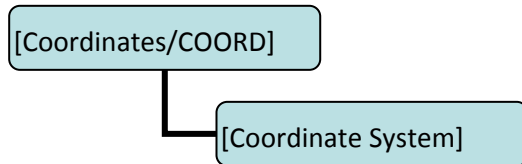
The coordinates interface shows coordinate system info, including coordinate system and compensation.

In the main interface, press [Coordinate] to enter coordinate system.

Workpiece coordinate system

Display workpiece coordinate system, i.e. the offset of workpiece home position and machine tool home position. Totally six basic workpiece coordinate systems (G54~G59) and nine extension coordinate systems (G591~G599) are available.

To enter workpiece coordinate system interface:



The workpiece coordinate system interface is shown below:

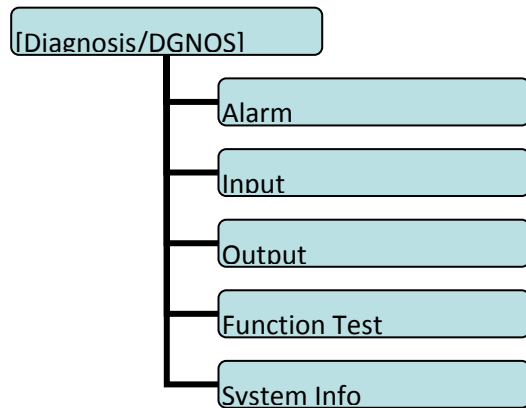
Coord		JOG		Run		Edit		Param		Coord		Test	
		Coord		Exp		Set		Halve		T Cut		Test	
abs pos		G54		G55									
X	+0000.000	X	+ 0.000	X	+ 0.000								
Y	+0000.000	Y	+ 0.000	Y	+ 0.000								
Z	+0000.000	Z	+ 0.000	Z	+ 0.000								
machine pos		G56		G57									
X	+0000.000	X	+ 0.000	X	+ 0.000								
Y	+0000.000	Y	+ 0.000	Y	+ 0.000								
Z	+0000.000	Z	+ 0.000	Z	+ 0.000								
rel pos		A		A									
X	+0000.000	A	+ 0.000	A	+ 0.000								
Y	+0000.000												
Z	+0000.000												
Stop													
<<<		Coord		Expiate		Set		HALVE		TCheck		Measure >>>	

Workpiece Coordinate System Setting Interface

8.11. Controller diagnosis interface (diagnosis)

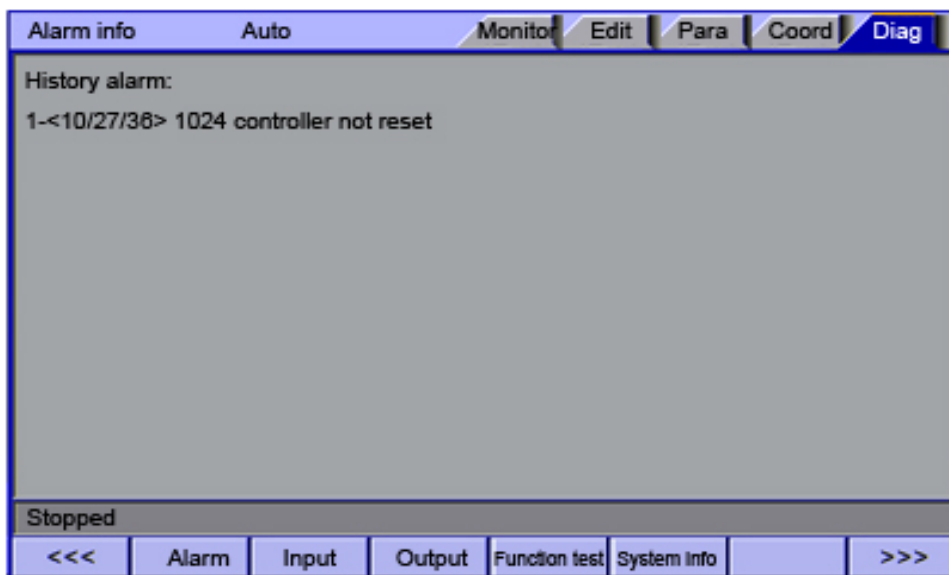
The diagnosis interface is used to display the hardware interfaces and system info, including alarm, input, output, DA diagnosis; press [Diagnosis] to enter the diagnosis interface.

The diagnosis interface follows:

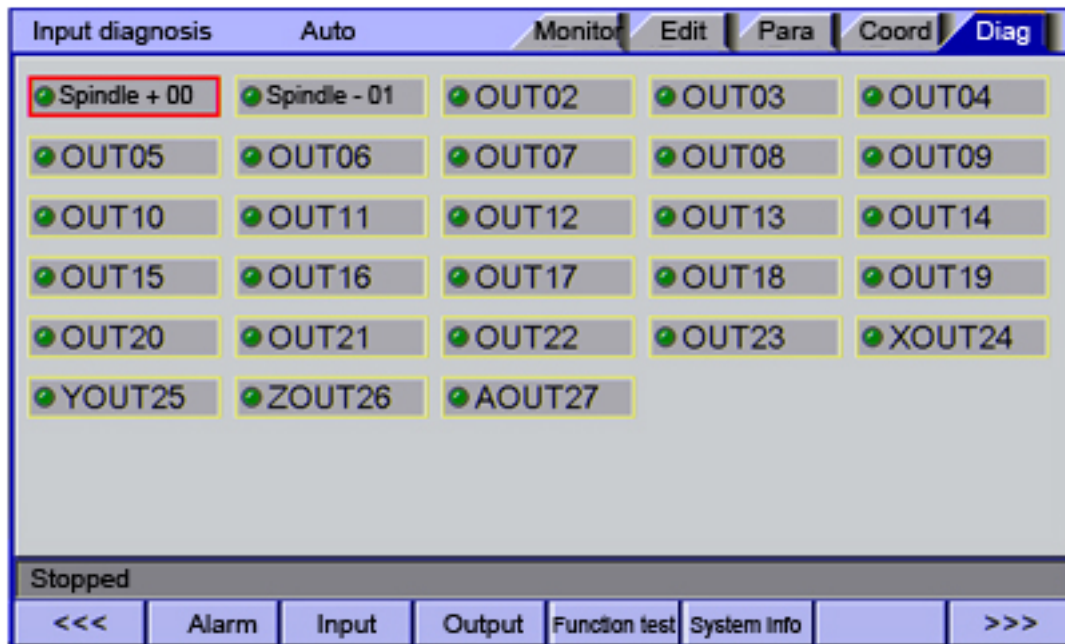
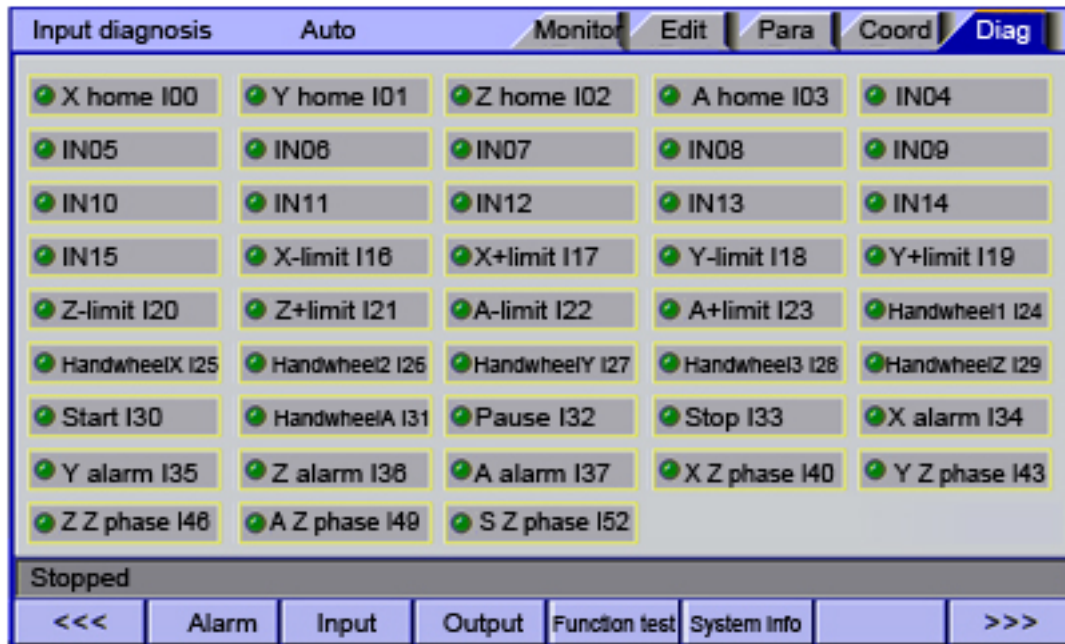


Alarm interface

Display the alarm of the system after power on, including 15 alarm records.



IO diagnosis interface



IO diagnosis allows entering at any moment. You can check current IO state of the system. In manual mode, press the direction keys to select corresponding IO, and press EOB to control the output manually.

Function test interface

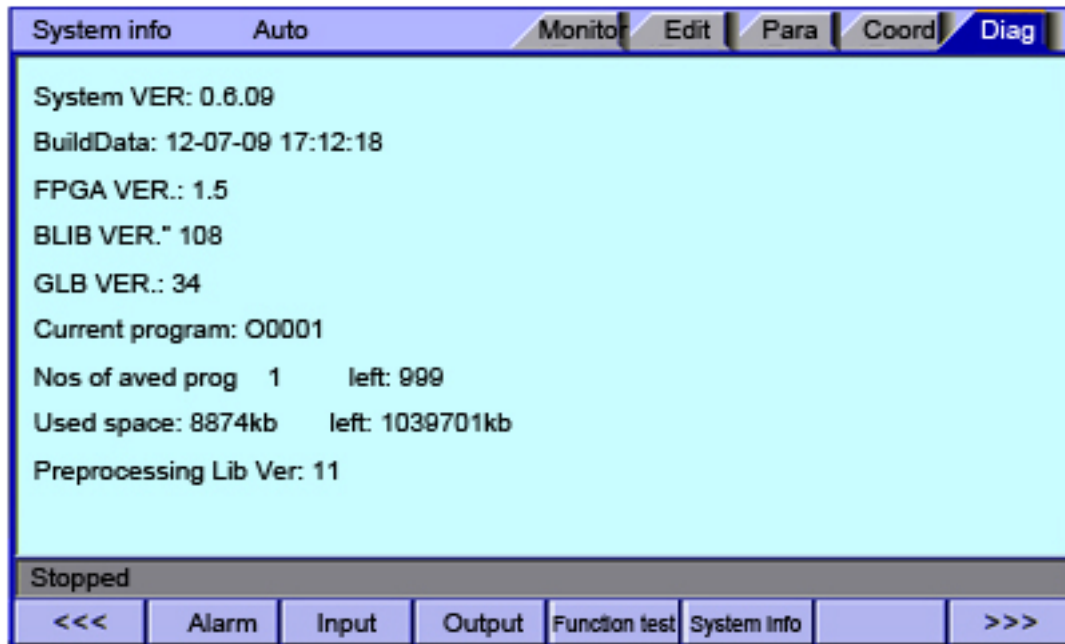
Correct the output voltage of two lines DA voltage module for testing; press the direction keys to output corresponding voltage directly, input the actually measured voltage to corresponding gear position; when transferring control instructions of principal axis, the system will correct according to correction value.

Function test		Auto	Monitor	Edit	Para	Coord	Diag
(1)0.0V	0.00	(1)0.5V	0.47	(1)1.0V	0.90	(1)1.5V	1.34
(1)2.0V	1.79	(1)2.5V	2.25	(1)3.0V	2.70	(1)3.5V	3.17
(1)4.0V	3.65	(1)4.5V	4.13	(1)5.0V	4.62	(1)5.5V	5.12
(1)6.0V	5.62	(1)6.5V	6.14	(1)7.0V	6.66	(1)7.5V	7.19
(1)8.0V	7.73	(1)8.5V	8.28	(1)9.0V	8.83	(1)9.5V	9.40
(1)10.0V	10.00						
(2)0.0V	0.00	(2)0.5V	0.47	(2)1.0V	0.90	(2)1.5V	1.34
(2)2.0V	1.79	(2)2.5V	2.25	(2)3.0V	2.70	(2)3.5V	3.17
(2)4.0V	3.65	(2)4.5V	4.13	(2)5.0V	4.62	(2)5.5V	5.12
(2)6.0V	5.62	(2)6.5V	6.14	(2)7.0V	6.66	(2)7.5V	7.19
(2)8.0V	7.73	(2)8.5V	8.28	(2)9.0V	8.83	(2)9.5V	9.40
(2)10.0V	10.00						
Stopped							
<<<	Alarm	Input	Output	Function test	System Info		>>>

The principal axis function is used for testing; the principal axis has encoder, which displays current state of the principal axis, e.g. actual speed of principal axis, encoder line setting, current principal axis angle, and current position of principal axis.

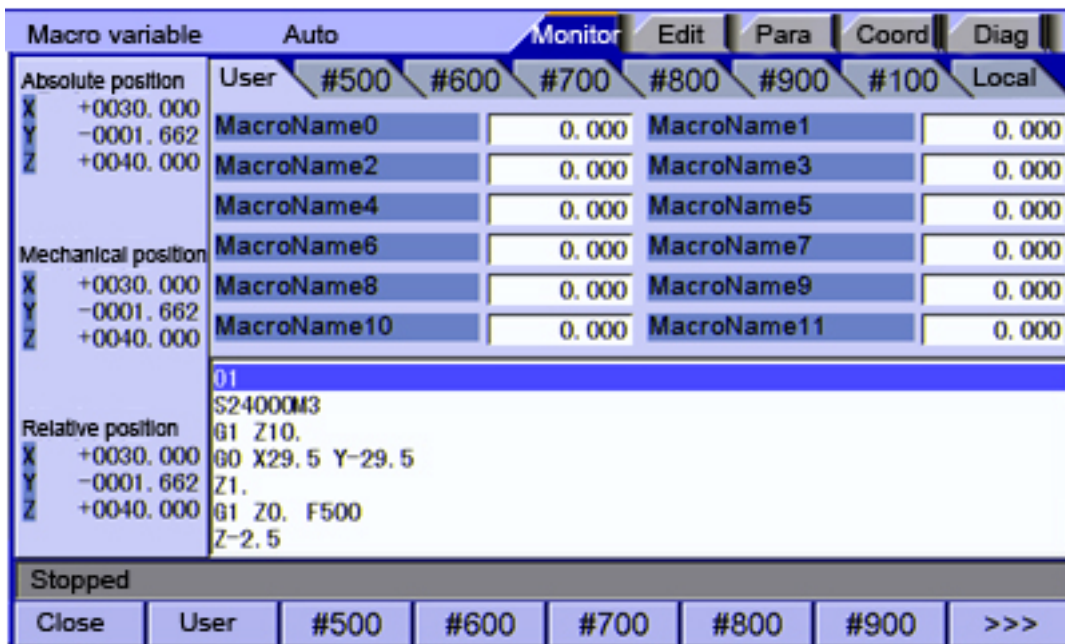
Function test	Auto	Monitor	Edit	Para	Coord	Diag
Spindle parameter info						
① Current spindle speed	0 Rpm					
② Spindle encoder wire	0					
③ Current spindle position	0					
④ Current spindle angle	0.000					
When the system is pause state and edit mode, press "S" key to pop up the dialog box, Input the Z phase home times and then press OK to start testing. Rotate the spindle manually first before test.						
Stopped						
<<<	Alarm	Input	Output	Function test	System info	>>>

The system info shows basic information of current system, and is used to mark current software version, hardware version, upgrade info, etc. In this interface, you can follow the prompt to perform operations.

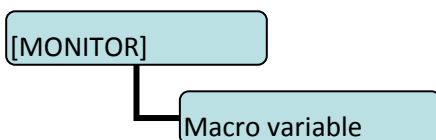


8.12. Macro variable view interface (macro variable)

This is the variable register view menu of macro function. In this menu, you can turn pages to view the macro variables, or enter values to variable register directly in edit mode.



To enter macro variable view interface:



The macro variable menu has eight levels, as below:

Local variable

#100~#199

#500~#599

#600~#699

#700~#799

#800~#899

#900~#999

Process variable



In the variable interfaces of different levels, you can check the corresponding variable number. Local variable has five

levels totally, and shows the variables of current working layer by default. To view a specific layer, please enter local

variable submenu, and then select according to layers. Process variables are to customize the names of 20 variables

(#100~#999) according to CSV configuration table, so that the variable names have visual meanings. In programs, the user

customized variables are transferred with variable number. **Current mode instruction info**

Display the G code mode info of current system;

In [Monitor] interface, you can check the running code info of current system:

Motion instruction:	G00,G01
Select plane:	G17,G18,G19
Coordinate logic:	G90,G91
Workpiece coordinate system:	G54,...G59,G591...G599
Radius compensation:	G40,G41,G42
Length compensation:	G43,G44,G49
Compound instruction retracting plane:	G98,G99
Principal axis rotation:	S
Tool No.:	T

As the information in the red dotted box in the figure below

9. System maintenance

9.1. Restart

After program update, you need to restart the system to make the settings take effect. Cold start and warm start are available. For cold start, turn off the power supply directly, and then turn on; for warm start, carry out the following operation when the system is running normally and the processing is stopped:

(1) In the main menu, press [] to enter the program interface;

(2) Press [File] to enter the file interface;

(3) Press [] and the system asks whether restart or not, as shown in Fig. 9-1;

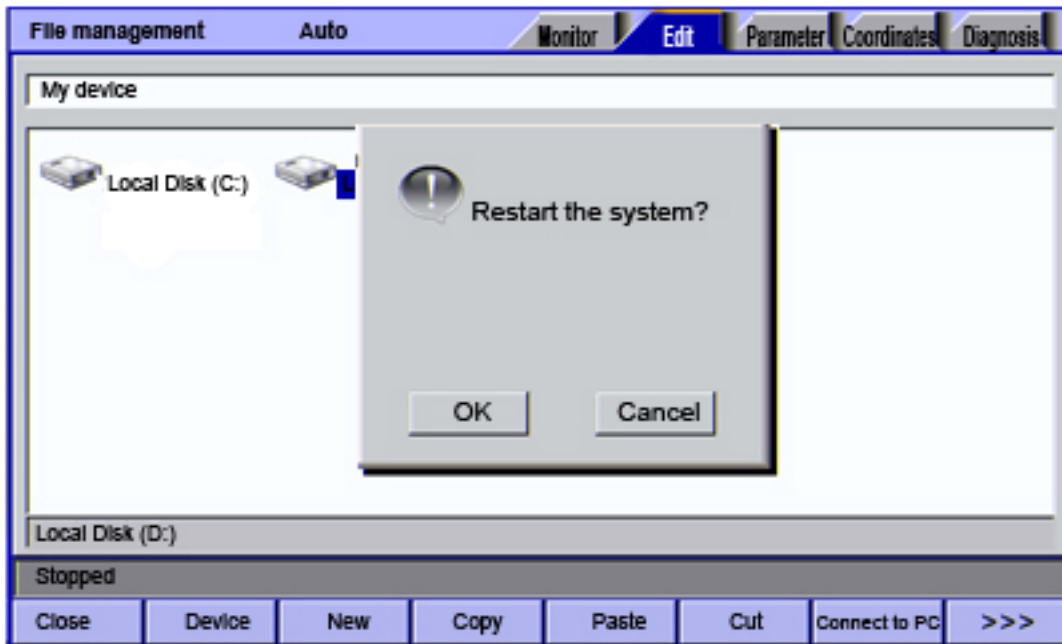


Fig. 9-1

(4) Press [] to restart the system.

In the file management interface, you can also press [] on the panel to enter directly.

9.2. System upgrade

After system update, all parameters of the system will be initialized. To restore the original parameters after update, you can back up the parameters before update, and then restore the parameters after update. For parameter backup and restore, please refer to section 9.3 and 9.4.

Before update, press [Diagnosis] [System info] to view current version information of the software, in order to compare whether the update is successful, as shown in Fig. 9-2-1:

The system info window is shown below:

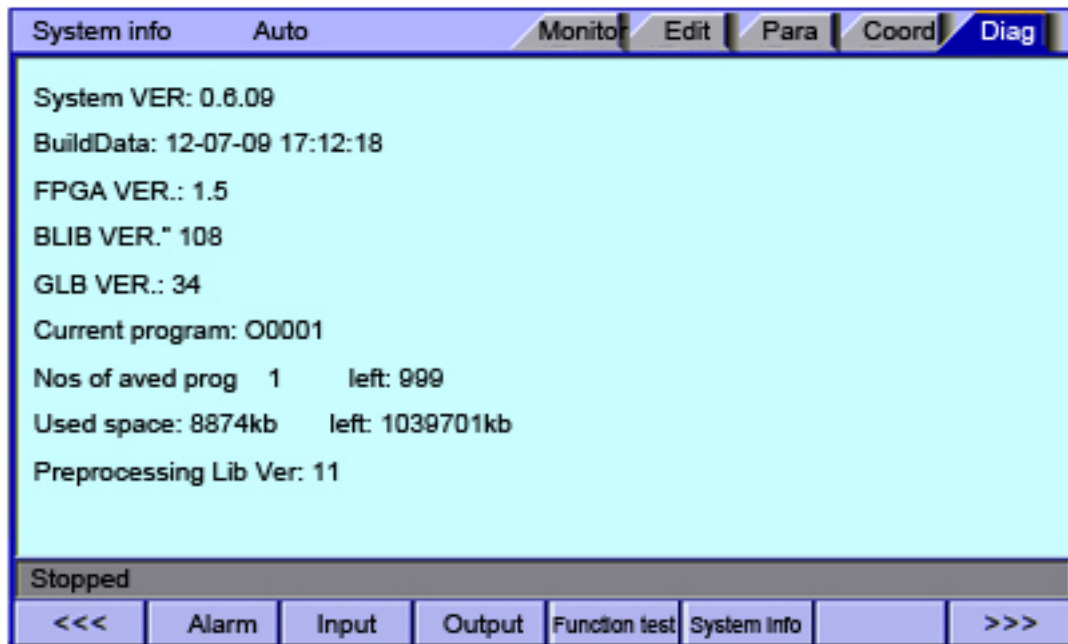


Fig. 9-2-1

The step of copying upgrade program with USB disk follows:

- (1) In the main menu, press [Edit] to enter the program interface;
- (3) Press [File] to enter file management interface;
- (3) Insert the USB disk, select the USB disk symbol in the root directory; after reading successfully, the system enters the USB directory automatically;
- (5) Move cursor to the upgrade file ADTROM.BIN, select [Copy] to pop up a prompt window as shown in Fig. 9-2-2, and press [EOB] to update; if there is no prompt window, please check the file name is valid.
- (5) Select the second upgrade file NC_RES.NC; skip this step if the file doesn't exist. The operation is same as (4).

(6) After update, enter BIOS and then update the program: when the system is restarting, press [Cancel] to enter and show six options, which are 0: System Settings; 1: BIOS Settings ... 6: Language; select 1: BIOS Settings - 1 - Program, and press Y to confirm; after that, the system prompts that the programming is done.

(7) After update, enter system info of the Diagnosis menu to view the system version number and programming date, and confirm whether the update is successful, as shown in Fig. 9-2-1.

The system update window is shown below:

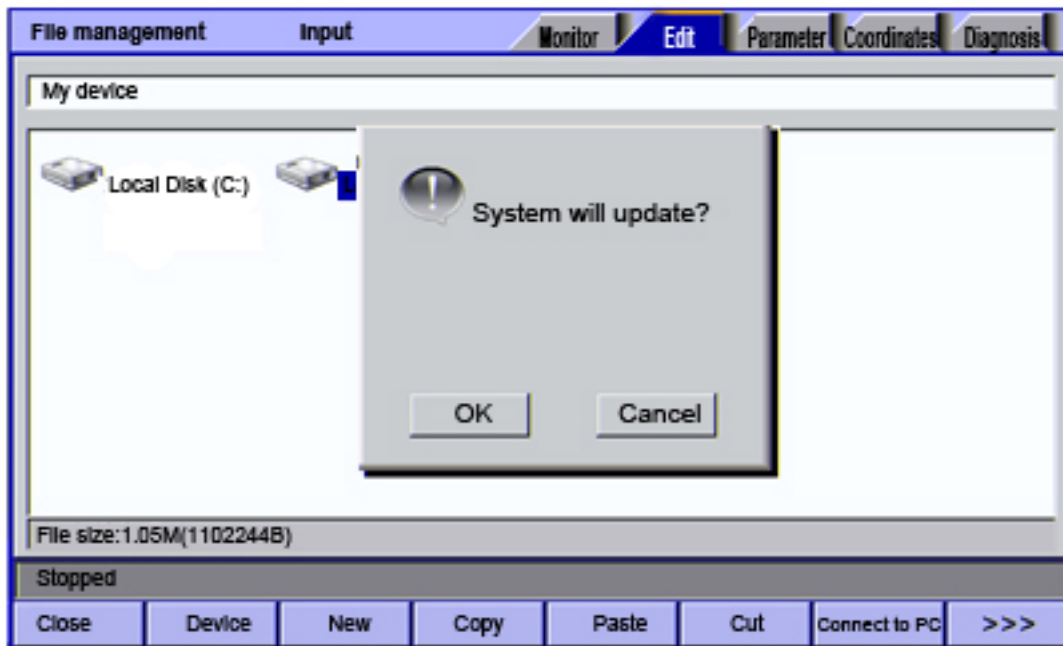


Fig. 9-2-2

9.3. Restore factory parameters

This operation will restore all system parameters will be reset to the default. After initialized, most of the parameters are valid. The user can edit the parameters according to equipment definition and requirements, or restore the backed parameters.

(1) Press [Edit] to switch to edit mode;

(2) In the main menu, press [] to enter the parameter interface;

(3) Press the [Management] key to enter the management parameter interface;

(4) Move cursor to "006 Reset all parameters";

EOB

(5) Press **EOB**, the system asks whether clear all parameters, as shown in Fig. 9-3; press [EOB] again, the system restores the default parameters and restarts automatically.

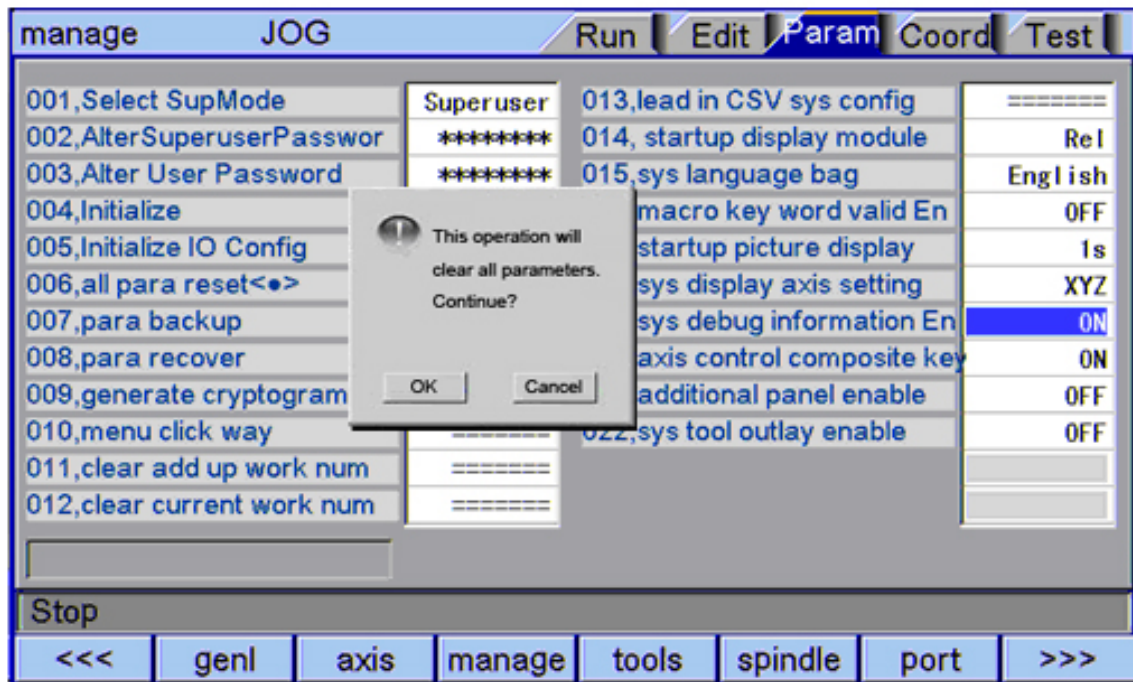


Fig. 9-3

9.4. Parameter backup and restore

This function can back up the modified parameters. When the system is updated or initialized, the parameters can be restored to avoid setting the parameters repeatedly. The backup files can be copied to other engraving system. Therefore, please back up the parameters after adjusting and restore the parameters directly in the new machine. The parameter backup and restore method is described below:

- (1) Select the edit mode;
- (2) In the main menu, press [Parameter] to enter the parameter interface;
- (3) Press the [Management] key to enter the management parameter interface;
- (4) Move cursor to 007 or 008, and select corresponding operation menu;
- (5) Press [EOB], the system confirms, and performs backup or restore operation;
- (6) The backup operation will generate the SYSCONF.BAK file in the root directory of disk D. Please save this file for backup in the future.

(7) For restore operation, also save the SYSCONF.BAK file in the root directory of disk D. The system will recognize this file automatically in the process of restoring.

9.5. Entering BIOS

(1) If the system has irreversible error and can't be started, please enter BIOS to upgrade and maintain the program;

(2) To enter BIOS, press the [Cancel] key after the controller is electrified and before the application is started; after entering, a blue background interface pops up. If the BIOS requires password, a prompt pops up. Please type the password to enter the BIOS.

(3) Enter BIOS to perform operations such as format disk C, D, and copy files from USB disk to upgrade;

10. System parameters

According to occasions and functions, the parameters contain General parameters, IO configuration parameters, management parameters and coordinate setting parameters.

-  General parameters are complete, and contain basic operation and usage settings of the controller, including principal axis, handwheel, home, tool magazine, etc.;
-  IO configuration parameters are mainly used for machine installation and test, adapting to the interface characteristics of machine tool and motor drive;
-  Coordinate setting parameters are tool setting configuration in [Coordinate] interface;

(1) It is required to confirm user identity to modify the parameter table. The controller has two levels of user authority, which are super user and operator; super user can modify all parameters and user passwords; while operator only can operate the parameters that require modification; in P3.1 of management parameters, the system enters the corresponding mode automatically according to the entered password.

(2) According to the application, the parameters will take effect immediately or after restarted; the parameters that require restart are marked with <●>.

(3) Certain parameters are set in binary system (parameter descriptor has bit symbol); the conversion between binary system and decimal system follows:

- Bit0: Set to 1 to correspond to decimal 1;
- Bit1: Set to 1 to correspond to decimal 2;
- Bit2: Set to 1 to correspond to decimal 4;
- Bit3: Set to 1 to correspond to decimal 8;
- Bit4: Set to 1 to correspond to decimal 16;
- Bit5: Set to 1 to correspond to decimal 32;
- Bit6: Set to 1 to correspond to decimal 64;

Bit7: Set to 1 to correspond to decimal 128;

For more bits, multiply the decimal system corresponding to binary system of previous position by 2. If only the corresponding bit is 1, accumulate the numbers of corresponding decimal system according to the comparison table to get the setting value.

For example: set Bit0, Bit1 and Bit5 to 1, and the parameter will be $1+2+32=35$.

(4) All modified parameters must be saved in [EDIT] mode and the system has stopped; for nonnumeric parameters, press the EOB key and select in the popup dialog box.

10.1. Parameter index list

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	001	X Gear Numerator	Instant		
General parameter (P1.)	002	X Gear Denominator	Instant		
General parameter (P1.)	003	Y Gear Numerator	Instant		
General parameter (P1.)	004	Y Gear Denominator	Instant		
General parameter (P1.)	005	Z Gear Numerator	Instant		
General parameter (P1.)	006	Z Gear Denominator	Instant		
General parameter (P1.)	007	4 Gear Numerator	Instant		
General parameter (P1.)	008	4 Gear Denominator	Instant		
General parameter (P1.)	009	X FastSpeed(mm/min)	Instant		
General parameter (P1.)	010	Y FastSpeed(mm/min)	Instant		
General parameter (P1.)	011	Z FastSpeed(mm/min)	Instant		
General parameter (P1.)	012	4 FastSpeed(mm/min)	Instant		
General parameter (P1.)	013	XStartupSpeed(mm/min)	Instant		
General parameter (P1.)	014	YstartupSpeed(mm/min)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	015	ZstartupSpeed(mm/min)	Instant		
General parameter (P1.)	016	4StartupSpeed(mm/min)	Instant		
General parameter (P1.)	017	X Acceleration(Kpps)	Instant		
General parameter (P1.)	018	Y Acceleration(Kpps)	Instant		
General parameter (P1.)	019	Z Acceleration(Kpps)	Instant		
General parameter (P1.)	020	4 Acceleration(Kpps)	Instant		
General parameter (P1.)	021	X Soft PosLimit+(mm)	Instant		
General parameter (P1.)	022	X Soft PosLimit-(mm)	Instant		
General parameter (P1.)	023	Y Soft PosLimit+(mm)	Instant		
General parameter (P1.)	024	Y Soft PosLimit-(mm)	Instant		
General parameter (P1.)	025	Z Soft PosLimit+(mm)	Instant		
General parameter (P1.)	026	Z Soft PosLimit-(mm)	Instant		
General parameter (P1.)	027	4 Soft PosLimit+(mm)	Instant		
General parameter (P1.)	028	4 Soft PosLimit-(mm)	Instant		
General parameter (P1.)	029	Inp Speed(mm/min)	Instant		
General parameter (P1.)	030	InpStartSpeed(mm/min)	Instant		
General parameter (P1.)	031	InpAcceleration(mm/sec)	Instant		
General parameter (P1.)	032	XBacklashExpiate(pulse)	Instant		
General parameter (P1.)	033	YBacklashExpiate(pulse)	Instant		
General parameter (P1.)	034	ZBacklashExpiate(pulse)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	035	4BacklashExpiate(pulse)	Instant		
General parameter (P1.)	036	ZeroReturn Mode	Instant		
General parameter (P1.)	037	IO FilterWave(1~8)	Instant		
General parameter (P1.)	038	Communication mode <●>	Restart		
General parameter (P1.)	039	MaxFeedSpeed(mm/min)	Instant		
General parameter (P1.)	040	MaxMPGSpeed(mm/min)	Instant		
General parameter (P1.)	041	Wheel Coefficient	Instant		
General parameter (P1.)	042	M Code Delaytime(ms)	Instant		
General parameter (P1.)	043	X HOME Offset(pulse)	Instant		
General parameter (P1.)	044	Y HOME Offset(pulse)	Instant		
General parameter (P1.)	045	Z HOME Offset(pulse)	Instant		
General parameter (P1.)	046	4 HOME Offset(pulse)	Instant		
General parameter (P1.)	047	Line number	Instant		
General parameter (P1.)	048	System Baudrate <●>	Restart		
General parameter (P1.)	049	Controler ID<●>	Restart		
General parameter (P1.)	050	X HomeDir	Instant		
General parameter (P1.)	051	Y HomeDir	Instant		
General parameter (P1.)	052	Z HomeDir	Instant		
General parameter (P1.)	053	4 HomeDir	Instant		
General parameter (P1.)	054	Circle InpUnit(mm)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	055	G73(M)LoopObligate(mm)	Instant		
General parameter (P1.)	056	G83(M)LoopObligate(mm)	Instant		
General parameter (P1.)	057	ArcSpeedUpVal	Instant		
General parameter (P1.)	058	interpolation speed mode	Instant		
General parameter (P1.)	059	GCode pre-treatment	Instant		
General parameter (P1.)	060	'O'Pro Scan	Instant		
General parameter (P1.)	061	SpindleControlMode	Instant		
General parameter (P1.)	062	X ZeroReturn Speed	Instant		
General parameter (P1.)	063	Y ZeroReturn Speed	Instant		
General parameter (P1.)	064	Z ZeroReturn Speed	Instant		
General parameter (P1.)	065	4 ZeroReturn Speed	Instant		
General parameter (P1.)	066	Safe Signal ELevel	Instant		
General parameter (P1.)	067	Pressure Signal ELevel	Instant		
General parameter (P1.)	068	ChuckSignal ELevel	Instant		
General parameter (P1.)	069	OilPressure Open(min)	Instant		
General parameter (P1.)	070	OilPressure Keep(sec)	Instant		
General parameter (P1.)	071	OilPressureOut Freq(Hz)	Instant		
General parameter (P1.)	072	OilInspect ELevel	Instant		
General parameter (P1.)	073	SpindleAlarm ELevel	Instant		
General parameter (P1.)	074	TransduserAlarm ELevel	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	075	ExScram ELevel	Instant		
General parameter (P1.)	076	BackHome ModeConf(bit)	Instant		
General parameter (P1.)	077	Arc Acc.for Radii	Instant		
General parameter (P1.)	078	Arc Acc.for Speed	Instant		
General parameter (P1.)	079	PretreatmentCode Set	Instant		
General parameter (P1.)	080	Inp AccSpeed Mode	Instant		
General parameter (P1.)	081	'S'Speed Acceleration	Instant		
General parameter (P1.)	082	ExStart ELevel	Instant		
General parameter (P1.)	083	ExPause ELevel	Instant		
General parameter (P1.)	084	HOME Check for alarm	Instant		
General parameter (P1.)	085	HOME Check Enable	Instant		
General parameter (P1.)	086	X diameter prog enable	Instant	Invalid	
General parameter (P1.)	087	default process plane	Instant		
General parameter (P1.)	088	T code form	Instant	Invalid	
General parameter (P1.)	089	IP address <●>	Restart		
General parameter (P1.)	090	subnet mask <●>	Restart		
General parameter (P1.)	091	default gateway <●>	Restart		
General parameter (P1.)	092	Pretreatment segments	Instant		
General parameter (P1.)	093	feed speed setting En	Instant		
General parameter (P1.)	094	enable of G00 Inp mode	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	095	Abnormal memory location jump enable	Instant	OFF	
General parameter (P1.)	096	Pause Z to safe height enable	Instant	OFF	
General parameter (P1.)	097	Pause A to safe height enable	Instant	OFF	
General parameter (P1.)	098	Program reset reference point enable	Instant	OFF	
General parameter (P1.)	099	Mechanical reset reference point enable	Instant	OFF	
General parameter (P1.)	100	Clear coordinate system in reset mode	Instant	G54 Coord	
General parameter (P1.)	101	Z safe height (G54 coordinates)	Instant	0.000	
General parameter (P1.)	102	A safe height (G54 coordinates)	Instant	0.000	
General parameter (P1.)	103	Z feeding speed limit (mm/min)	Instant	0	
General parameter (P1.)	104	A feeding speed limit (mm/min)	Instant	0	
General parameter (P1.)	105	X manual speed (mm/min)	Instant	1000	
General parameter (P1.)	106	Y manual speed (mm/min)	Instant	1000	
General parameter (P1.)	107	Z manual speed (mm/min)	Instant	1000	
General parameter (P1.)	108	A manual speed (mm/min)	Instant	1000	
General parameter (P1.)	109	Thread cutting acceleration pitch P (mm)	Instant		
General parameter (P1.)	110	Thread cutting deceleration pitch D (mm)	Instant		
General parameter (P1.)	111	Thread cutting withdrawal V (mm)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	112	X screw offset function enable	Instant	OFF	
General parameter (P1.)	113	Y screw offset function enable	Instant	OFF	
General parameter (P1.)	114	Z screw offset function enable	Instant	OFF	
General parameter (P1.)	115	A screw offset function enable	Instant	OFF	
General parameter (P1.)	116	X screw offset pitch (mm)	Instant	10.000	
General parameter (P1.)	117	Y screw offset pitch (mm)	Instant	10.000	
General parameter (P1.)	118	Z screw offset pitch (mm)	Instant	10.000	
General parameter (P1.)	119	A screw offset pitch (mm)	Instant	10.000	
General parameter (P1.)	120	X screw offset start position (mm)	Instant	0.000	
General parameter (P1.)	121	Y screw offset start position (mm)	Instant	0.000	
General parameter (P1.)	122	Z screw offset start position (mm)	Instant	0.000	
General parameter (P1.)	123	A screw offset start position (mm)	Instant	0.000	
General parameter (P1.)	124	X screw offset end position (mm)	Instant	0.000	
General parameter (P1.)	125	Y screw offset end position (mm)	Instant	0.000	
General parameter (P1.)	126	Z screw offset end position (mm)	Instant	0.000	
General parameter (P1.)	127	A screw offset end position (mm)	Instant	0.000	
General parameter (P1.)	128	Go to M98 time/line enable	Instant	OFF	
General parameter (P1.)	129	System start reset	Instant	Not reset	
General parameter (P1.)	130	Cooler alarm effective level	Instant	0	
General parameter (P1.)	131	External reset effective level	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	132	Lubricant level alarm effective level	Instant		
General parameter (P1.)	133	Spindle brake delay (ms)	Instant		
Axis parameter (P2.)	001	X_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)	002	Y_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)	003	Z_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)	004	A_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)	005	X_ServoResetOut ELeve	Instant		
Axis parameter (P2.)	006	Y_ServoResetOut ELeve	Instant		
Axis parameter (P2.)	007	Z_ServoResetOut ELeve	Instant		
Axis parameter (P2.)	008	A_ServoResetOut ELeve	Instant		
Axis parameter (P2.)	009	X_ECZ Home Enable	Instant		
Axis parameter (P2.)	010	X_ECZ Home ELevel	Instant		
Axis parameter (P2.)	011	Y_ECZ Home Enable	Instant		
Axis parameter (P2.)	012	Y_ECZ Home ELevel	Instant		
Axis parameter (P2.)	013	Z_ECZ Home Enable	Instant		
Axis parameter (P2.)	014	Z_ECZ Home ELevel	Instant		
Axis parameter (P2.)	015	4_ECZ Home Enable	Instant		
Axis parameter (P2.)	016	4_ECZ Home ELevel	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	017	X Limit+ Enable<●>	Instant	Invalid	
Axis parameter (P2.)	018	X Limit- Enable<●>	Instant	Invalid	
Axis parameter (P2.)	019	X Limit ELevel<●>	Instant		
Axis parameter (P2.)	020	Y Limit+ Enable<●>	Instant	Invalid	
Axis parameter (P2.)	021	Y Limit- Enable<●>	Instant	Invalid	
Axis parameter (P2.)	022	Y Limit ELevel<●>	Instant		
Axis parameter (P2.)	023	Z Limit+ Enable<●>	Instant	Invalid	
Axis parameter (P2.)	024	Z Limit- Enable<●>	Instant	Invalid	
Axis parameter (P2.)	025	Z Limit ELevel<●>	Instant		
Axis parameter (P2.)	026	4 Limit+ Enable<●>	Instant	Invalid	
Axis parameter (P2.)	027	4 Limit- Enable<●>	Instant	Invalid	
Axis parameter (P2.)	028	4 Limit ELevel<●>	Instant		
Axis parameter (P2.)	029	X Pulse Mode<●>	Instant		
Axis parameter (P2.)	030	Y Pulse Mode<●>	Instant		
Axis parameter (P2.)	031	Z Pulse Mode<●>	Instant		
Axis parameter (P2.)	032	4 Pulse Mode<●>	Instant		
Axis parameter (P2.)	033	X Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)	034	Y Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)	035	Z Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)	036	4 Pulse Dir Mode<●>	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	037	X Ext Home ELevel	Instant		
Axis parameter (P2.)	038	Y Ext Home ELevel	Instant		
Axis parameter (P2.)	039	Z Ext Home ELevel	Instant		
Axis parameter (P2.)	040	4 Ext Home ELevel	Instant		
Axis parameter (P2.)	041	X Round Setting<●>	Instant		
Axis parameter (P2.)	042	Y Round Setting<●>	Instant		
Axis parameter (P2.)	043	Z Round Setting<●>	Instant		
Axis parameter (P2.)	044	4 Round Setting<●>	Instant		
Axis parameter (P2.)	045	X physial Assign Num<●>	Instant		
Axis parameter (P2.)	046	Y physial Assign Num<●>	Instant		
Axis parameter (P2.)	047	Z physial Assign Num<●>	Instant		
Axis parameter (P2.)	048	4 physial Assign Num<●>	Instant		
Axis parameter (P2.)	049	spindle physial Assign Num<●>	Instant		
Axis parameter (P2.)	050	X Encoder bit(p)	Instant		
Axis parameter (P2.)	051	Y Encoder bit(p)	Instant		
Axis parameter (P2.)	052	Z Encoder bit(p)	Instant		
Axis parameter (P2.)	053	4 Encoder bit(p)	Instant		
Axis parameter (P2.)	054	X Reset to 360	Instant		
Axis parameter (P2.)	055	Y Reset to 360	Instant		
Axis parameter (P2.)	056	Z Reset to 360	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	057	4 Reset to 360	Instant		
Axis parameter (P2.)	058	X PulseLogic Level<●>	Instant		
Axis parameter (P2.)	059	Y PulseLogic Level<●>	Instant		
Axis parameter (P2.)	060	Z PulseLogic Level<●>	Instant		
Axis parameter (P2.)	061	4 PulseLogic Level<●>	Instant		
Axis parameter (P2.)	062	X feature(Rotate0 Line1)<●>	Instant		
Axis parameter (P2.)	063	Y feature(Rotate0 Line1)<●>	Instant		
Axis parameter (P2.)	064	Z feature(Rotate0 Line1)<●>	Instant		
Axis parameter (P2.)	065	4 feature(Rotate0 Line1)<●>	Instant		
Axis parameter (P2.)	066	X Rolling Display Usage	Instant		
Axis parameter (P2.)	067	Y Rolling Display Usage	Instant		
Axis parameter (P2.)	068	Z Rolling Display Usage	Instant		
Axis parameter (P2.)	069	4 Rolling Display Usage	Instant		
Axis parameter (P2.)	070	X Rolling Path Optimize	Instant		
Axis parameter (P2.)	071	Y Rolling Path Optimize	Instant		
Axis parameter (P2.)	072	Z Rolling Path Optimize	Instant		
Axis parameter (P2.)	073	4 Rolling Path Optimize	Instant		
Axis parameter (P2.)	074	Max Acc of X(Kpps)	Instant		
Axis parameter (P2.)	075	Max Acc of Y(Kpps)	Instant		
Axis parameter (P2.)	076	Max Acc of Z(Kpps)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	077	Max Acc of 4(Kpps)	Instant		
Axis parameter (P2.)	078	X Servo Home Dir	Instant		
Axis parameter (P2.)	079	Y Servo Home Dir	Instant		
Axis parameter (P2.)	080	Z Servo Home Dir	Instant		
Axis parameter (P2.)	081	A Servo Home Dir	Instant		
Axis parameter (P2.)	082	X Ext Home Eanble	Instant		
Axis parameter (P2.)	083	Y Ext Home Eanble	Instant		
Axis parameter (P2.)	084	Z Ext Home Eanble	Instant		
Axis parameter (P2.)	085	4 Ext Home Eanble	Instant		
Axis parameter (P2.)	086	X Encoder LogicDir<●>	Instant		
Axis parameter (P2.)	087	Y Encoder LogicDir<●>	Instant		
Axis parameter (P2.)	088	Z Encoder LogicDir<●>	Instant		
Axis parameter (P2.)	089	4 Encoder LogicDir<●>	Instant		
Axis parameter (P2.)	090	X Home Dec	Instant		
Axis parameter (P2.)	091	Y Home Dec	Instant		
Axis parameter (P2.)	092	Z Home Dec	Instant		
Axis parameter (P2.)	093	4 Home Dec	Instant		
Axis parameter (P2.)	094	X Home Scanning Speed	Instant		
Axis parameter (P2.)	095	Y Home Scanning Speed	Instant		
Axis parameter (P2.)	096	Z Home Scanning Speed	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	097	4 Home Scanning Speed	Instant		
Axis parameter (P2.)	098	rotation axis opt feature	Instant		
Axis parameter (P2.)	099	4 axis max rotate speed	Instant		
Axis parameter (P2.)	100	hand wheel encoder dir	Instant		
Axis parameter (P2.)	101	X restrain acc (mm/s ²)	Instant		
Axis parameter (P2.)	102	Y restrain acc (mm/s ²)	Instant		
Axis parameter (P2.)	103	Z restrain acc (mm/s ²)	Instant		
Axis parameter (P2.)	104	4 restrain acc (mm/s ²)	Instant		
Axis parameter (P2.)	105	X max restrain rate (mm/s)	Instant		
Axis parameter (P2.)	106	Y max restrain rate (mm/s)	Instant		
Axis parameter (P2.)	107	Z max restrain rate (mm/s)	Instant		
Axis parameter (P2.)	108	4 max restrain rate (mm/s)	Instant		
Axis parameter (P2.)	109	X lock brake signal enable	Instant	0	
Axis parameter (P2.)	110	Y lock brake signal enable	Instant	0	
Axis parameter (P2.)	111	Z lock brake signal enable	Instant	0	
Axis parameter (P2.)	112	A lock brake signal enable	Instant	0	
Axis parameter (P2.)	113	X lock brake delay time	Instant	0	
Axis parameter (P2.)	114	Y lock brake delay time	Instant	0	
Axis parameter (P2.)	115	Z lock brake delay time	Instant	0	
Axis parameter (P2.)	116	A lock brake delay time	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
Management parameter (P3.)	001	Select SupMode	Instant		
Management parameter (P3.)	002	AlterSuperuserPasswor	Instant		
Management parameter (P3.)	003	Alter User Password	Instant		
Management parameter (P3.)	004	Initialize	Restart		
Management parameter (P3.)	005	Initialize IO Config	Restart		
Management parameter (P3.)	006	all para reset<●>	Restart		
Management parameter (P3.)	007	para backup	Instant		
Management parameter (P3.)	008	para recover	Restart		
Management parameter (P3.)	009	generate cryptogram	Instant		
Management parameter (P3.)	010	menu click way	Instant		
Management parameter (P3.)	011	clear add up work num	Instant		
Management parameter (P3.)	012	clear current work num	Instant		
Management parameter (P3.)	013	lead in CSV sys config<●>	Restart		
Management parameter (P3.)	014	startup display module<●>	Restart	Rel	
Management parameter (P3.)	015	sys language bag<●>	Restart	English	
Management parameter (P3.)	016	macro key word valid En	Instant		
Management parameter (P3.)	017	startup picture display	Instant	1S	
Management parameter (P3.)	018	sys display axis setting	Instant	XYZ	
Management parameter (P3.)	019	sys debug information En	Instant	OFF	

Parameter type	S/N	Description	Effective mode	Default value	Page
Management parameter (P3.)	020	axis control composite	Instant	ON	
Management parameter (P3.)	021	additional panel enable	Instant	OFF	
Management parameter (P3.)	022	M macro program selection<●>	Restart	MFUNC(M)	
Management parameter (P3.)	023	T macro program selection<●>	Restart	TFUNC(M)	
Management parameter (P3.)	024	PLC program selection<●>	Restart	PLC(M)	
Management parameter (P3.)	025	Screen saver on	Instant	0	
Management parameter (P4.)	001	Current tool number	Instant		
Management parameter (P4.)	002	System cutter	Instant		
Management parameter (P4.)	003	ATC reference position X (mm)	Instant		
Management parameter (P4.)	004	ATC reference position Y (mm)	Instant		
Management parameter (P4.)	005	ATC reference position Z (mm)	Instant		
Management parameter (P4.)	006	ATC safety height (mm)	Instant		
Management parameter (P4.)	007	ATC high speed (mm/min)	Instant		
Management parameter (P4.)	008	ATC low speed (mm/min)	Instant		
Management parameter (P4.)	009	Quick decline position (mm)	Instant		
Management parameter (P4.)	010	Tool placing position (mm)	Instant		
Management parameter (P4.)	011	Tool cutting position (mm)	Instant		
Management parameter (P4.)	012	Spindle air blow hold time (ms)	Instant		
Management parameter (P4.)	013	X-safe position after tool change (mm)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Management parameter (P4.)	014	Y-safe position after tool change (mm)	Instant		
Management parameter (P4.)	015	Tool spacing (mm)	Instant		
Management parameter (P4.)	016	Vertical-type position offset (mm)	Instant		
Principal axis parameter (P5.)	001	Spi.Alarm ELevel	Instant		
Principal axis parameter (P5.)	002	Spi.Reset ELevel	Instant		
Principal axis parameter (P5.)	003	Spi.ECZ Home Enable	Instant		
Principal axis parameter (P5.)	004	Spi.ECZ ELevel	Instant		
Principal axis parameter (P5.)	005	Spi. Limit+ Enable	Instant		
Principal axis parameter (P5.)	006	Spi. Limit- Enable	Instant		
Principal axis parameter (P5.)	007	Spi.Limit ELevel	Instant		
Principal axis parameter (P5.)	008	Spi.Pulse Mode	Instant		
Principal axis parameter (P5.)	009	Spi.Pulse Logic Mode	Instant		
Principal axis parameter (P5.)	010	Spi.HomeDect ELevel	Instant		
Principal axis parameter (P5.)	011	Spi.ExtHome Check En	Instant		
Principal axis parameter (P5.)	012	Spi.Round Setting	Instant		
Principal axis parameter (P5.)	013	Spi.Encode bits(p)	Instant		
Principal axis parameter (P5.)	014	Spi.ZeroOffset(p)	Instant		
Principal axis parameter (P5.)	015	PulseLogic Level	Instant		
Principal axis parameter (P5.)	016	Rolling Display Usage	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Principal axis parameter (P5.)	017	Spi.Max Acc(Kpps)	Instant		
Principal axis parameter (P5.)	018	Spi.Ext HomeDir	Instant		
Principal axis parameter (P5.)	019	Spi.Servo HomeDir	Instant		
Principal axis parameter (P5.)	020	Spi.Max Speed(rpm)	Instant		
Principal axis parameter (P5.)	021	Spi.Home Speed(rpm)	Instant		
Principal axis parameter (P5.)	022	Spi.Gear Numerator	Instant		
Principal axis parameter (P5.)	023	Spi.Gear Denominator	Instant		
Principal axis parameter (P5.)	024	Spi.Encoder Logic Dir	Instant		
Principal axis parameter (P5.)	025	Spi.OpenDelayTime(ms)	Instant		
Principal axis parameter (P5.)	026	Servo spindle ready level	Instant	0	
Principal axis parameter (P5.)	027	Servo spindle quasi stop in-place level	Instant	0	
Principal axis parameter (P5.)	028	Servo spindle zero speed in-place level	Instant	0	
Principal axis parameter (P5.)	029	Servo spindle speed arrival level	Instant	0	
Principal axis parameter (P5.)	030	System spindle speed	Instant	100	
Principal axis parameter (P5.)	031	If close spindle while executing M30	Instant	0	
Principal axis parameter (P5.)	032	Minimum spindle speed (rpm)	Instant		
Port parameter (P6.)	001	Wheel0.1	Instant		
Port parameter (P6.)	002	Wheel0.01	Instant		
Port parameter (P6.)	003	Wheel0.001	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	004	X Wheel	Instant		
Port parameter (P6.)	005	Y Wheel	Instant		
Port parameter (P6.)	006	Z Wheel	Instant		
Port parameter (P6.)	007	A Wheel	Instant		
Port parameter (P6.)	008	SCRAM	Instant		
Port parameter (P6.)	009	STOP	Instant		
Port parameter (P6.)	010	STARTUP	Instant		
Port parameter (P6.)	011	X Alarm	Instant		
Port parameter (P6.)	012	Y Alarm	Instant		
Port parameter (P6.)	013	Z Alarm	Instant		
Port parameter (P6.)	014	4 Alarm	Instant		
Port parameter (P6.)	015	IN0-----wire No.: (1-24)	Instant		
Port parameter (P6.)	016	IN1-----wire No.: (1-24)	Instant		
Port parameter (P6.)	017	IN2-----wire No.: (1-24)	Instant		
Port parameter (P6.)	018	IN3-----wire No.: (1-24)	Instant		
Port parameter (P6.)	019	IN4-----wire No.: (1-24)	Instant		
Port parameter (P6.)	020	IN5-----wire No.: (1-24)	Instant		
Port parameter (P6.)	021	IN6-----wire No.: (1-24)	Instant		
Port parameter (P6.)	022	IN7-----wire No.: (1-24)	Instant		
Port parameter (P6.)	023	IN8-----wire No.: (1-24)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	024	IN9-----wire No.: (1-24)	Instant		
Port parameter (P6.)	025	IN10-----wire No.: (1-24)	Instant		
Port parameter (P6.)	026	IN11-----wire No.: (1-24)	Instant		
Port parameter (P6.)	027	IN12-----wire No.: (1-24)	Instant		
Port parameter (P6.)	028	IN13-----wire No.: (1-24)	Instant		
Port parameter (P6.)	029	IN14-----wire No.: (1-24)	Instant		
Port parameter (P6.)	030	IN15-----wire No.: (1-24)	Instant		
Port parameter (P6.)	031	IN16-----wire No.: (1-24)	Instant		
Port parameter (P6.)	032	IN17-----wire No.: (1-24)	Instant		
Port parameter (P6.)	033	IN18-----wire No.: (1-24)	Instant		
Port parameter (P6.)	034	IN19-----wire No.: (1-24)	Instant		
Port parameter (P6.)	035	IN20-----wire No.: (1-24)	Instant		
Port parameter (P6.)	036	IN21-----wire No.: (1-24)	Instant		
Port parameter (P6.)	037	IN22-----wire No.: (1-24)	Instant		
Port parameter (P6.)	038	IN23-----wire No.: (1-24)	Instant		
Port parameter (P6.)	039	OUT0-----wire No.: (1-24)	Instant		
Port parameter (P6.)	040	OUT1-----wire No.: (1-24)	Instant		
Port parameter (P6.)	041	OUT2-----wire No.: (1-24)	Instant		
Port parameter (P6.)	042	OUT3-----wire No.: (1-24)	Instant		
Port parameter (P6.)	043	OUT4-----wire No.: (1-24)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	044	OUT5-----wire No.: (1-24)	Instant		
Port parameter (P6.)	045	OUT6-----wire No.: (1-24)	Instant		
Port parameter (P6.)	046	OUT7-----wire No.: (1-24)	Instant		
Port parameter (P6.)	047	OUT8-----wire No.: (1-24)	Instant		
Port parameter (P6.)	048	OUT9-----wire No.: (1-24)	Instant		
Port parameter (P6.)	049	OUT10-----wire No.: (1-24)	Instant		
Port parameter (P6.)	050	OUT11-----wire No.: (1-24)	Instant		
Port parameter (P6.)	051	OUT12-----wire No.: (1-24)	Instant		
Port parameter (P6.)	052	OUT13-----wire No.: (1-24)	Instant		
Port parameter (P6.)	053	OUT14-----wire No.: (1-24)	Instant		
Port parameter (P6.)	054	OUT15-----wire No.: (1-24)	Instant		
Port parameter (P6.)	055	OUT16-----wire No.: (1-24)	Instant		
Port parameter (P6.)	056	OUT17-----wire No.: (1-24)	Instant		
Port parameter (P6.)	057	OUT18-----wire No.: (1-24)	Instant		
Port parameter (P6.)	058	OUT19-----wire No.: (1-24)	Instant		
Port parameter (P6.)	059	OUT20-----wire No.: (1-24)	Instant		
Port parameter (P6.)	060	OUT21-----wire No.: (1-24)	Instant		
Port parameter (P6.)	061	OUT22-----wire No.: (1-24)	Instant		
Port parameter (P6.)	062	OUT23-----wire No.: (1-24)	Instant		
Port parameter (P6.)	063	Safe Signal	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	064	PressureDect Port	Instant		
Port parameter (P6.)	065	ChuckDectect Port	Instant		
Port parameter (P6.)	066	SysOilOut Port	Instant		
Port parameter (P6.)	067	TChecking signal Port	Instant		
Port parameter (P6.)	068	AlarmLight Out Port	Instant	6	
Port parameter (P6.)	069	RunLight Out Port	Instant	7	
Port parameter (P6.)	070	VFD 0 Level Out Port	Instant		
Port parameter (P6.)	071	VFD 1 Level Out Port	Instant		
Port parameter (P6.)	072	VFD 2 Level Out Port	Instant		
Port parameter (P6.)	073	VFD 3 Level Out Port	Instant		
Port parameter (P6.)	074	Oiling Out Port	Instant	5	
Port parameter (P6.)	075	Cooler Out Port	Instant	4	
Port parameter (P6.)	076	Spindle CW Out Port	Instant	0	
Port parameter (P6.)	077	Spindle CCW Out Port	Instant	1	
Port parameter (P6.)	078	System OilDect Port	Instant		
Port parameter (P6.)	079	SpindleAlarm DetectPort	Instant		
Port parameter (P6.)	080	Transduser DetectPort	Instant		
Port parameter (P6.)	081	ExScram2 DetectPort	Instant		
Port parameter (P6.)	082	Air of ToolCheck OutPort	Instant	11	
Port parameter (P6.)	083	IO Conf in RESET 00~15	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	084	IO Conf in RESET 16~23	Instant		
Port parameter (P6.)	085	ExStart2 DetectPort	Instant		
Port parameter (P6.)	086	ExPause2 DetectPort	Instant		
Port parameter (P6.)	087	TCheck Limit DetectPort	Instant		
Port parameter (P6.)	088	Servo spindle enable output port No.	Instant		
Port parameter (P6.)	089	Servo spindle quasi stop output port No.	Instant		
Port parameter (P6.)	090	Servo spindle pulse control output No.	Instant		
Port parameter (P6.)	091	Servo spindle rigid tapping output No.	Instant		
Port parameter (P6.)	092	Servo spindle ready input No.	Instant		
Port parameter (P6.)	093	Servo spindle quasi stop input port No.	Instant		
Port parameter (P6.)	094	Servo spindle zero speed in-place input port No.	Instant		
Port parameter (P6.)	095	Servo spindle speed arrival input port No.	Instant		
Port parameter (P6.)	096	Reset off LED configuration 0-31	Instant		
Port parameter (P6.)	097	Reset off LED configuration 32-63	Instant		
Port parameter (P6.)	098	X lock brake output port	Instant		
Port parameter (P6.)	099	Y lock brake output port	Instant		
Port parameter (P6.)	100	Z lock brake output port	Instant		
Port parameter (P6.)	101	A lock brake output port	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	102	Spindle frequency alarm reset port	Instant		
Port parameter (P6.)	103	Cooler alarm detection port	Instant		
Port parameter (P6.)	104	External reset input port	Instant		
Port parameter (P6.)	105	Elastic cutter input port	Instant		
Port parameter (P6.)	106	Spindle air blow output port	Instant	11	
Port parameter (P6.)	107	Lubricant level alarm input port	Instant		
Port parameter (P6.)	108	Spindle brake output port	Instant		

10.2. General parameter (P1.)

001	X Gear Numerator
002	X Gear Denominator
003	Y Gear Numerator
004	Y Gear Denominator
005	Z Gear Numerator
006	Z Gear Denominator
007	4 Gear Numerator
008	4 Gear Denominator

Range : 1~65535

Unit : None

Authority : Operation admin or higher

Default : 1

Effective : Instant

time

Note : When screws of different pitches and motors of different step angles or servo motors of different pulses are matched, or connected through gears, it allows keeping the program and actual motion distance consistent through electronic gear ratio setting of the system.

$CMR/CMD = P / (L \times 1000)$

CMR: gear ratio numerator

CMD: gear ratio denominator

P: Pulses corresponding to one rotation of the motor

L: Machine tool movement corresponding to one rotation of the motor (mm)

CMD/CMR is the pulse equivalent actually, i.e. the motion distance corresponding to every pulse (unit: 0.001mm).

Ex 1: the motor rotates one cycle every 5000 pulses, and the machine tool moves 5mm when the motor rotates one cycle, then

$$CMR/CMD = 5000 / (5 \times 1000) = 1/1$$

Then, CMR=1, CMD=1, the pulse equivalent is 0.001mm

Ex 2: the motor rotates one cycle every 5000 pulses, and the machine tool moves 10mm when the motor rotates one cycle, then

$$CMR/CMD = 5000 / (10 \times 1000) = 1/2$$

Then, CMR=1, CMD=2, the pulse equivalent is 0.002mm

009	X FastSpeed(mm/min)
010	Y FastSpeed(mm/min)
011	Z FastSpeed(mm/min)
012	4 FastSpeed(mm/min)
013	XStartupSpeed(mm/min)
014	YStartupSpeed(mm/min)
015	ZStartupSpeed(mm/min)
016	4StartupSpeed(mm/min)
017	X Acceleration(Kpps)
018	Y Acceleration(Kpps)
019	Z Acceleration(Kpps)
020	4 Acceleration(Kpps)

Range : 1~200000, 1~200000, 1~8000

Unit : mm/min, mm/min, Kpps

Authority : Operation admin or higher

Default : 3000, 100, 1000

Effective time : Instant

Note : This parameter is the trapezoid acceleration/deceleration setting and

used for G00 instruction

About start speed, 1-2 rotation motor speed is recommended for step motor; as above, the machine tool moves 5mm when the motor rotates one cycle, and the speed is 5-10mm/sec (300-600mm/min). For servo motor, the start and stop shouldn't have vibration. If this speed is too high, it will cause vibration during motion, and the step motor will be out of step. If the machine tool vibrates when starting and stopping, you can reduce the acceleration.

The acceleration and start speed also affect manual speed, home speed, etc.;

021	X Soft PosLimit+(mm)
022	X Soft PosLimit-(mm)
023	Y Soft PosLimit+(mm)
024	Y Soft PosLimit-(mm)
025	Z Soft PosLimit+(mm)
026	Z Soft PosLimit-(mm)
027	4 Soft PosLimit+(mm)
028	4 Soft PosLimit-(mm)

Range : -9999~9999

Unit : mm

Authority : Operation admin or higher

Default : Maximum positive/negative value

Effective time : Instant

Note : Generally, the machine tool has hard limit signal. In this case, software limit isn't required. Please set the positive limit to +9999.999, and negative limit to -9999.999.

If hard limit switch isn't installed, please use soft limit, which uses machine tool coordinate system as the base point. Positive limit and negative limit are subject to actual distance (unit: mm).

Since soft limit decelerates and stops at the limit point, it may exceed the set distance, which depends on acceleration time and speed. Please keep certain margin when setting this parameter.

029	Inp Speed(mm/min)
030	InpStartSpeed(mm/min)

031	InpAcceleration(mm/sec)
039	XBacklashExpiate(pulse)

Range : 1~200000, 1~200000, 1~8000, 1~200000
Unit : mm/min,mm/min,mm/sec,mm/min
Authority : Operation admin or higher
Default : 3000,200,1000,3000
Effective time : Instant
Note : The feeding instructions such as G01, G02 and G03 move at the speed of F instruction. If the F instruction isn't specified in the program, the above instructions move at the speed set by this parameter. If the F instruction is specified, this parameter will be invalid.

The maximum feeding speed restricts the F instruction during processing, i.e. no matter what F is set, the actual speed can't exceed this parameter value. Setting this parameter will prevent the damage caused by accidental speed programming error when transferring processing files.

032	XBacklashExpiate(pulse)
033	YBacklashExpiate(pulse)
034	ZBacklashExpiate(pulse)
035	4BacklashExpiate(pulse)

Range : 1~20000
Unit : Pulse
Authority : Operation admin or higher
Default : 0
Effective time : Instant
Note : 1. Compensate the clearance between control axis

2. Compensate with the pulse in minimum unit. The specific number should be converted according to gear ratio. For example, the backlash measured by the machine tool is 0.1mm and the gear ratio of the system is CMR/CMD=1/1, the compensation pulses is $p=0.1*1000*1/1=100$.

036	ZeroReturn Mode
-----	-----------------

Range : 0~1
Unit : None
Authority : Operation admin or higher
Default : 0 (program)
Effective time : Instant

Note : 0 - Program home

1 - Mechanical home

Program home is that the coordinates go to home, i.e. in place.

Mechanical home requires external detection switch to locate the home position; while home operation, move to specified home direction at home speed, and move back slowly after signal is detected. At this moment, move forward slowly when the signal is disconnected, and the home operation completes when the signal is valid again. When the servo Z phase enable switch in IO configuration parameters is enabled, mechanical home will enable Z phase positioning as home position automatically after signal reaches.

037

IO FilterWave(1~8)

Range : 0~8
 Unit : None
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : Set the filter constant;

If the environment has too much interference, e.g. rain and thunder, please enter a filter value. Higher value indicates longer test time and high reliability; 0 indicates no filter;

038

Communication mode

Range : 0~3
 Unit : None
 Authority : Operation admin or higher
 Default : 0
 Effective time : Restart
 Note : Set the communication mode of the system;

System can communicate through the serial port, network and PC or other device, 0 is Uart serial port, 1 is network communication, 2 is NoUser and system communication is turned off;

040

MaxMPGSpeed(mm/min)

041	Wheel Coefficient
	Range : 500~10000 100~3000 Unit : mm/min Authority : Operation admin or higher Default : 9000, 1000 Effective time : Instant Note : Set handwheel speed and acceleration; In handwheel mode, the maximum speed of handwheel movement controlled by setting the maximum speed of the handwheel, wheel coefficient is to control the acceleration of the wheel; if the machine vibrates in handwheel mode, please adjust the two parameters to smaller; however, the machine response will be slow if it is too small; please adjust to the maximum value as long as there is no vibration;
042	M Code Delay time
	Range : 0~9999 Unit : ms Authority : Operation admin or higher Default : 100 Effective time : Instant Note : Set the waiting time (unit: ms) after executing M code
043	X HOME Offset(pulse)
044	Y HOME Offset(pulse)
045	Z HOME Offset(pulse)
046	4 HOME Offset(pulse)
	Range : -9999~9999 Unit : mm Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Set the compensation home offset after axis home operation. First, complete the mechanical home operation, offset corresponding pulse, and then set this point as mechanical home. Note: This parameter is invalid during program home operation.
047	Line number

Range	:	0~64
Unit	:	None
Authority	:	Operation admin or higher
Default	:	0
Effective time	:	Instant
Note	:	While editing G code manually, add a line number Nxxxxx automatically in a new line;

0 indicates that this function is disabled;

048	System Baudrate
-----	-----------------

Range	:	9600~115200
Unit	:	None
Authority	:	Operation admin or higher
Default	:	115200
Effective time	:	Restart
Note	:	The communication rate setting when DNC or other PC software and this controller are in RS232 communication mode

049	Controller ID
-----	---------------

Range	:	1~255
Unit	:	None
Authority	:	Operation admin or higher
Default	:	1
Effective time	:	Restart
Note	:	The ID number setting of the controller when DNC or other PC software and this controller are in MODBUS communication mode

050	X HomeDir
051	Y HomeDir
052	Z HomeDir
053	4 HomeDir

Range	:	0~1
Unit	:	None
Authority	:	Operation admin or higher
Default	:	1,1,0,0
Effective time	:	Instant
Note	:	Set the mechanical home direction of every processing axis

Positive

Negative

Home direction is valid in mechanical home mode, that is, the system scans the home signal direction of the machine in the home process.

054	Circle InpUnit(mm)
	Range : 0~1
	Unit : mm
	Authority : Operation admin or higher
	Default : 0.2
	Effective time : Instant
	Note : Set the arc interpolation equivalent
	If this value is too small, the arc has higher approximation accuracy, but the computation will be too high, making the pause during processing obvious and affecting the processing effect.
055	G73(M)LoopObligate(mm)
056	G83(M)LoopObligate(mm)
	Range : 0.1~100
	Unit : mm
	Authority : Operation admin or higher
	Default : 2.000
	Effective time : Instant
	Note : Set the tool retracting amount after Q is fed in G73 and G83 instructions; this parameter (default: 2mm) is set according to actual chip removal effect.
057	ArcSpeedUpVal
	Range : 0&1
	Unit :
	Authority : Operation admin or higher
	Default : 1
	Effective time : Instant
	Note : Set arc speed processing mode

As for arc split, 0 is to interpolate through time split arc, and 1 is to interpolate through step split arc.

058	Interpolation speed mode	Range : 0~1 Unit : None Authority : Operation admin or higher Default : 0 Effective time : Instant Note : In pretreatment mode, set to 0 to use corner speed balancing algorithm, or set to 1 to use axis acceleration constraints balancing algorithm
059	GCode pre-treatment	Range : 0~1 Unit : None Authority : Operation admin or higher Default : 0 (real-time processing) Effective time : Instant Note : Real-time processing is suitable for machine test. In pretreatment mode, the system enters processing state buffs for two seconds and pre-reads. The pretreatment mode only can check the direction and size of feeding segment to adjust the speed automatically and process at optimized speed.
060	'O'Pro Scan	Range : 0~1 Unit : None Authority : Operation admin or higher Default : 1 Effective time : Instant Note : File scanning symbol will quicken the file transfer speed when processing large files. When transferring NC files, the system needs to scan over to position every program block. In this way, if the file only has one block and the file size is very big, it will cause unnecessary waiting time. If this option is closed, the system will exit after scanning the address of first block.
061	SpindleControlMode	Range : 0~1 Unit : None

Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : Control mode corresponding to principal axis S code (frequency conversion mode)

0: Analog output

1: Section speed regulation (4-digit code), as below:

OUT23-----S0

OUT22-----S1

OUT21-----S2

OUT20-----S3

In analog output mode, the analog voltage is:

$$V=S/\text{MaxRPM}$$

S is the rotation set by the user, and MaxRPM is the maximum rotation of principal axis set by the parameter (P4.017);

In switching quantity mode, constitute block 0-15 according to four-digit code to output; S code value is restricted to 0-15;

062	X ZeroReturn Speed
063	Y ZeroReturn Speed
064	Z ZeroReturn Speed
065	4 ZeroReturn Speed

Range : 0~9999
 Unit : mm/min
 Authority : Operation admin or higher
 Default : 1000
 Effective time : Instant
 Note : Set the home speed of every axis separately; both program home and mechanical home use this parameter

066	Safe Signal ELevel
-----	--------------------

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : Set the effective voltage level of the system safety signal. The source of safety signal can be customized by the user, and generally may be

electric cabinet door and similar sensitive occasions. If there are several insecure places, please connect the signals in parallel to safety signal test pin of the system.

Considering the convenience of maintenance, safety signals are checked only when the system starts processing, and won't prompt in idle state.

067	Pressure Signal ELevel
068	ChuckSignal ELevel

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : Set the effective voltage level of system air pressure alarm; set the effective voltage level of system chuck alarm.

Both air pressure alarm and emergency stop alarm are effective globally; the detection ports of air pressure alarm and chuck alarm are set in port parameters.

069	OilPressure Open(min)
070	OilPressure Keep(sec)
071	OilPressureOut Freq(Hz)
072	OilInspect ELevel

Range : 0~ 10000 1~10000 0~100 0,~ 1
 Unit : Min Sec Hz LOGIC VOLTAGE LEVEL
 Authority : Operation admin or higher
 Default : 0, 1, 0, 0
 Effective time : Instant
 Note : Set the system lubricating function.

Oil pressure timing open parameter controls the lubrication timing function, 0 is to turn off the lubrication, non-zero is to turn on the lubrication port after the time specified by timing parameters (min); the oil pressure hold time sets the hold time of output lubrication port (unit: second), oil control frequency is to control the lubrication signal output mode, 0 is the jog mode, non-zero is the time to control the

lubrication signal in the output holding time (unit: HZ). Oil pressure detection level parameter is to set whether detect the effective level in the holding time. Lubrication output port and oil pressure detection port are set by parameters 066 and 078.

073	SpindleAlarm ELevel
074	TransducerAlarm ELevel

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : The above alarms are checked while the system is running. The system alarms once the test is valid.

This port is affected by IO configuration.

075	ExScram ELevel
082	ExStart ELevel
083	ExPause ELevel

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : External emergency stop, start and pause button of the system

The effective level for extended function detection; this port is affected by IO configuration.

076	BackHome ModeConf(bit)
-----	------------------------

Range : 0~10000
 Unit : None
 Authority : Operation admin or higher
 Default : Z-XY
 Effective time : Instant
 Note : Configure the axis and order of automatic back home of the system.

Be default, it backs to Z-axis first and then XY axis. Other home mode

can be configured by modifying this parameter. The setting method is pressing the EOB key and selecting in the pop-up dialog box, and press and hold the EOB key for three seconds to exit. The black option indicates home operation. You can press UP/DOWN key and Page Up/Down key to select the home axis and stage.

077	Arc Acc.for Radii
078	Arc Acc.for Speed

Range : 10~100 10~10000
 Unit : Coefficient
 Authority : Operation admin or higher
 Default : 50, 100
 Effective time : Instant
 Note : Used to restrict the arc processing speed automatically. This parameter is valid in pretreatment mode.

The bigger the radius coefficient is, the lower the arc speed is.

The bigger the acceleration coefficient is, the higher the arc speed is.

079	PretreatmentCode Set
-----	----------------------

Range : 100~1000
 Unit : Instruction line
 Authority : Operation admin or higher
 Default : 500
 Effective time : Instant
 Note : Set the pre-reading instruction lines; if the pretreatment processing pauses and pre-reads, please increase this value to pre-read more instructions.

080	Inp AccSpeed Mode
081	'S'Speed Acceleration

Range : 0~1 1000~10000
 Unit : None
 Authority : Operation admin or higher
 Default : 0, 5000
 Effective time : Instant
 Note : Used to set the performance of S curve acceleration/deceleration

The interpolation mode 0 is linear acceleration/deceleration, 1 is S

acceleration/deceleration, and this parameter is valid in preprocessing mode.

084	HOME Check for alarm
085	HOME Check Enable

Range : 0~1
 Unit : None
 Authority : Operation admin or higher
 Default : 0, 1
 Effective time : Instant
 Note : Used to set whether prompt user to reset under certain conditions, ensuring that the user has performed the operation;

If the value is set to 0, it won't check, and will run directly.

087	Default process plane
-----	-----------------------

Range : G17,18,19
 Unit : None
 Authority : Operation admin or higher
 Default : G18 (L series)/G17 (M series)
 Effective time : Instant
 Note : Set the default processing plane to XY or XZ; modify the default plane, so that it isn't need to specify the modal plane value while programming, and write plane related instructions directly in stead;

089	IP address
090	Subnet mask
091	Default gateway

Range : 0~255
 Unit : None
 Authority : Operation admin or higher
 Default : 192.168.0.123
 255.255.255.0
 192.168.0.1
 Effective time : Restart
 Note : Used to configure Ethernet parameters, which shall comply with the actual network settings, or else it can't be accessed normally.

After configured successfully, the user can perform the ping command

test on the PC of same network segment (same subnet mask) in the intranet. The connection has error if the return overtimes. Please check the physical connection.

The network environment requires independent NC network. Do not connect to office network or Internet, because the broadcast in the network and regular query of windows will block the network communication of NC.

092

Pretreatment segments

Range : 10~200
 Unit : None
 Authority : Operation admin or higher
 Default : 20
 Effective time : Instant
 Note : Pretreatment forward segments are used to set the segments of pretreatment preview.

The larger this value is, the greater the operation is, and the longer the waiting time before motion is.

During small segment interpolating, if this value is larger, the possibility of waiting for operation during motion will become higher; the balance value is set according to the actual processing effect.

If this value is smaller, the balance value is set according to the actual price effect because the forward data are insufficient and the speed can't be improved during small segment interpolating.

093

Feed speed setting En

Range : 0~1
 Unit : None
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : This parameter is used to modify the interpolation speed in programming, making F programming invalid.

Used for the cases that processing codes requires ignoring F-value. If this parameter is set to ON, F value in G code is invalid, and the system feeding speed is specified by 029# parameter.

094	Enable of G00 Inp mode
	Range : 0~1 Unit : None Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Used to set whether G00 instruction is moved with G01 mode If G01 mode is used, the interpolation speed shall follow the setting of minimum speed; The acceleration is the interpolation acceleration.
095	Abnormal memory location jump enable
	Range : ON~OFF Unit : None Authority : Operation admin or higher Default : ON Effective time : Instant Note : Used to restore the breakpoint position when the system is abnormal during automatic processing. If the system has power failure or exits abnormally during automatic running, the system will automatically save current breakpoint location, and will prompt whether run from the breakpoint after restarted. Press OK and the system will run from the breakpoint, ignoring the codes before the breakpoint.
096	Pause Z to safe height enable
	Range : ON~OFF Unit : None Authority : Operation admin or higher Default : OFF Effective time : Instant Note : Used to stop lifting Z axis to set safe height in automatic processing for safety's sake. When processing is started, it first locates the position before tool lifting, and then carries out unfinished processing.
097	Pause A to safe height enable
	Range : ON~OFF Unit : None Authority : Operation admin or higher Default : OFF Effective time : Instant Note : Used to stop lifting A axis to set safe height in automatic processing for safety's sake. When processing is started, it first locates the position before tool lifting, and then carries out unfinished processing.

098	Program reset reference point enable Range : ON~OFF Unit : None Authority : Operation admin or higher Default : OFF Effective time : Instant Note : Set whether return to set parameter reference point after mechanical home, OFF is not to return to reference point, ON is to return to the reference point after home operation. The reference point is set in coordinate system interface.
099	Mechanical reset reference point enable Range : ON~OFF Unit : None Authority : Operation admin or higher Default : OFF Effective time : Instant Note : Set whether return to set parameter reference point after mechanical home, OFF is not to return to reference point, ON is to return to the reference point after home operation. The reference point is set in coordinate system interface. The reference point is different from the point of program home. Reference points 1~4 are for mechanical home.
100	Clear coordinate system in reset mode Range : MAC Coord & G54 Coord Unit : None Authority : Operation admin or higher Default : MAC Coord Effective time : Instant Note : In system operation screen, press X, Y, Z, A in reset mode and then press the Cancel key to clear the coordinates. MAC is to clear machine coordinates, G54 is to clear program zero point, which is equivalent to the operation of tool setting. If it is set to G54, the program home operation is to return to the zero position of the workpiece.
101	Z safe height (G54 coordinates) Range : -9999~9999 Unit : mm Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Set the safe position of Z-axis of the machine tool, which can be machine tool coordinates or program coordinates, and specified by 096# parameter.
102	A safe height (G54 coordinates)

	Range : -9999~9999 Unit : mm Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Set the safe position of A-axis of the machine tool, which can be machine tool coordinates or program coordinates, and specified by 097# parameter. This parameter is generally suitable for machine tools with dual-spindle.
103	Z feeding speed limit (mm/min) Range : 0~20000 Unit : Mm/min Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Set the maximum speed of Z-axis feed, 0 for no limit, and non-zero for speed limit. In the process of adjusting, if the machine tool vibrates because Z-axis speed is too high, this parameter can be set to limit the Z axis speed. After setting, the parameter will limit the speed of the other interpolation axes and thus affect the overall processing speed.
104	A feeding speed limit (mm/min) Range : 0~20000 Unit : Mm/min Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Set the maximum speed of Z-axis feed, 0 for no limit, and non-zero for speed limit. In the process of adjusting, if the machine tool vibrates because Z-axis speed is too high, this parameter can be set to limit the Z axis speed. After setting, the parameter will limit the speed of the other interpolation axes and thus affect the overall processing speed.
105	X manual speed (mm/min)
106	Y manual speed (mm/min)
107	Z manual speed (mm/min)
108	A manual speed (mm/min)
	Range : 0~20000 Unit : Mm/min Authority : Operation admin or higher Default : 1000 Effective time : Instant Note : Set the continuous motion speed in manual mode. The manual rapid speed is G00 speed.

112	X screw offset function enable
113	Y screw offset function enable
114	Z screw offset function enable
115	A screw offset function enable

Range : ON~OFF
 Unit : None
 Authority : Operation admin or higher
 Default : OFF
 Effective time : Instant
 Note : Set whether screw pitch offset function is valid. OFF is to turn off screw pitch offset, and ON is to turn on screw pitch offset.

116	X screw offset pitch (mm)
117	Y screw offset pitch (mm)
118	Z screw offset pitch (mm)
119	A screw offset pitch (mm)

Range : 1~1000
 Unit : mm
 Authority : Operation admin or higher
 Default : 10
 Effective time : Instant
 Note : Set the screw offset pitch, which is generally set to 10mm, and acquired by laser interferometer.

120	X screw offset start position (mm)
121	Y screw offset start position (mm)
122	Z screw offset start position (mm)
123	A screw offset start position (mm)
124	X screw offset end position (mm)
125	Y screw offset end position (mm)
126	Z screw offset end position (mm)
127	A screw offset end position (mm)

	Range : -9999~9999 Unit : mm Authority : Operation admin or higher Default : 0.000 Effective time : Instant Note : The offset range when the screw offset function is turned on. The set position is the machine coordinates. For example, if the coordinate range of the machine is 0~100mm, you can set the starting position to 0, and set the end position to 100. The coordinates in this range are not compensated.
128	Go to M98 time/line enable Range : ON&OFF Unit : None Authority : Operation admin or higher Default : OFF Effective time : Instant Note : In the structure that the main program repeatedly calls subroutines, the user can turn on this parameter and run the program directly. Select ON, press 'I', and enter the calling time and line to run directly.
129	System start reset Range : Never, Ask, Always Unit : None Authority : Operation admin or higher Default : Never Effective time : Instant Note : Set the reset mode after the system is started. Never indicates that do not reset after started; ask indicates that the system asks whether reset after started (press EOB to reset or press Cancel to exit); always indicates that the system resets automatically after started.
130	Cooler alarm effective level Range : 0&1 Unit : Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Purpose and function to be specified
131	External reset effective level Range : 1&0 Unit :

Authority	:	Operation admin or higher
Default	:	0
Effective time	:	Instant
Note	:	Purpose and function to be specified

10.3. Axis parameter configuration (P2.)

001	X_ServoAlarmIn ELevel
002	Y_ServoAlarmIn ELevel
003	Z_ServoAlarmIn ELevel
004	A_ServoAlarmIn ELevel
005	X_ServoResetOut ELevel
006	Y_ServoResetOut ELevel
007	Z_ServoResetOut ELevel
008	A_ServoResetOut ELevel

Range	:	0~1
Unit	:	LOGIC VOLTAGE LEVEL
Authority	:	Super Admin
Default	:	1, 1
Effective time	:	Instant
Note	:	Adapt to the interface parameters of selected servo drive; please refer to interface voltage level description of servo for specific parameter settings. Servo alarm effective level can be set to 0 for stepper motor, or else servo alarm will be generated because the port level read by the system is 1. Reset effective level refers that the system will output alarm reset signal from pulse port if the user presses the Reset key when servo alarm occurs.

009	X_ECZ Home Enable
010	X_ECZ Home ELevel
011	Y_ECZ Home Enable
012	Y_ECZ Home ELevel
013	Z_ECZ Home Enable
014	Z_ECZ Home ELevel

015	4_ECZ Home Enable
016	4_ECZ Home ELevel

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Super Admin
 Default : 0
 Effective time : Instant
 Note : When this parameter is enabled, encoder Z phase positioning of corresponding axis will be enabled automatically in mechanical home mode, i.e. the “servo home” positioning; in this mode, the accuracy of repeated home positioning depends on servo positioning accuracy, and therefore it is recommended to enable this function for servo motor. Step motor doesn’t have encoder and can’t enable this option, or else the signals can’t be scanned during mechanical home operation and will move constantly.

017	X Limit+ Enable<●>
...	...
028	4 Limit ELevel<●>

Range : 0~1
 Unit : None
 Authority : Super Admin
 Default : 0
 Effective time : Restart
 Note : Hard limit has two modes, i.e. hardware response and software scanning;

Hardware response mode is integrated by the motion chip, and is triggered by the effective voltage level of the circuit test limit pin. Therefore, it is highly real-time, but it also has a defect. If the external interference is serious, the normal pulse will be affected and the system doesn’t alarm because it can’t read the error state in time, which will cause loss; therefore, this function requires that the wiring switch uses normally closed connection, i.e. high effective level; this function considers the complexity of field environment and the default value is off.

Scanning mode is integrated by the system and can’t be shielded. The scanning mode inputs signal by accessing specified function number and uses software anti-interference detection technology to check whether limit alarm occurs or has no interference. This requires certain time to check, and thus the real time isn’t as well as interrupted limit. However,

in most cases (at 10mm/min processing speed), it can meet the requirement on processing safety check.

The hardware response function of hard limit is prior to scanning response function, i.e. if the hardware response is enabled, it will quicken the response speed directly. It should be noted that the hardware response function only can stop pulse in instant mode. Therefore, the instant stop mode may cause mechanical vibration if the speed is too high. While software scanning mode uses maximum acceleration mode and decelerates according to the maximum acceleration set to every axis by the user (parameter P2.074~077), and therefore overshoot will occur.

029	X Pulse Mode (restart)
030	Y Pulse Mode (restart)
031	Z Pulse Mode (restart)
032	4 Pulse Mode (restart)

Range : 0~1
Unit : None
Authority : Super Admin
Default : 1
Effective time : Restart
Note : Pulse command format setting is to configure the mode of output pulse.
The compatible command format of the motor drive should be known in advance.

Pulse + pulse

Pulse + direction

033	X Pulse Dir Mode (restart)
034	Y Pulse Dir Mode (restart)
035	Z Pulse Dir Mode (restart)
036	4 Pulse Dir Mode (restart)

Range : 0~1
Unit : None
Authority : Super Admin
Default : 1
Effective time : Restart

Note : Set pulse direction; if the controller direction is reverse to actual drive direction, please modify this parameter to adjust the rotation direction of motor.

037	X Ext Home ELevel
038	Y Ext Home ELevel
039	Z Ext Home ELevel
040	A Ext Home ELevel

Range : 0~1
Unit : LOGIC VOLTAGE LEVEL
Authority : Super Admin
Default : 0
Effective time : Instant
Note : Set the effective voltage level of external home sensor switch during home operation.

Low level

High level

041	X Round Setting (restart)
042	Y Round Setting (restart)
043	Z Round Setting (restart)
044	4 Round Setting (restart)

Range : 0~99999999
Unit : Pulse
Authority : Super Admin
Default : 0
Effective time : Restart
Note :

- Round function is available on hardware version 1.5 or later only;
- This function is used to prevent the logic counting of axis exceeding the maximum counting range (2147483648) and causing overflow error;
- Generally, overflow occurs only when the axis is set to rotary. The system will calculate the corresponding pulse limit according to the gear ratio of current axis and assign to the ROUND parameter of corresponding axis, if current axis is set to rotary and uses 360° display mode after the system getting P2.062~P2.069 parameters. The user can check the change of this parameter when the rotary axis display function is enabled. The user can modify the changed

parameters, and the finally displayed number will be effective.

- This parameter requires restart to take effect; the corresponding axis must be rotary and set to 360° display (P2.062~069);

045	X physial Assign Num (restart)
046	Y physial Assign Num (restart)
047	Z physial Assign Num (restart)
048	4 physial Assign Num (restart)

Range : 0~4

Unit : Pulse port sequence No.

Authority : Super Admin

Default :

Effective time : Restart

Note : In default mode, the actual number of every axis corresponds to the silk screen number on the shell. If certain function axis is abnormal, you can replace the axis through this function. For example, set P2.045 to 4, P2.048 to 1, then, any operation to X axis will be the operation to A axis encoder port on the shell.

0: no such axis

1~4: corresponding to 1#-4# axis

049	Spindle physial Assign Num (restart)
-----	--------------------------------------

Range : 0~4

Unit : Pulse port sequence No.

Authority : Super Admin

Default :

Effective time : Restart

Note : It is set to 0 by default, indicating that the principal axis is in variable frequency control mode, i.e. analog or gear position control mode. To use servo principal axis, a coding port is required (servo principal axis must be in position control mode); you can modify this parameter to specify the function.

0: variable frequency principal axis adjusted by analog

1~4: corresponding to 1#-4# axis

Note: If a pulse port is specified as the function port of principal axis, the pulse port should be removed from previously corresponding function axis number, or else the system will assign to principal axis after restarted and the original function axis will be invalid.

050	X Encoder bit(p)
051	Y Encoder bit(p)
052	Z Encoder bit(p)
053	4 Encoder bit(p)

Range : 0~9999
 Unit : Wire number
 Authority : Super Admin
 Default : 2500
 Effective time : Instant
 Note : Set the encoder wires connected to every pulse port (AB phase pulse).
 Since four times frequency division is performed for internal transfer, the
 value of this parameter should be the pulses collected by the encoder
 for one cycle divided by 4.

058	X PulseLogic Level (restart)
059	Y PulseLogic Level (restart)
060	Z PulseLogic Level (restart)
061	4 PulseLogic Level (restart)

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Super Admin
 Default : 0
 Effective time : Restart
 Note : Set the normal voltage level when the pulse is working. If the setting is
 different from the normal voltage level required by motor drive, a
 direction will have accumulative error during every positive and negative
 motion (independent of pulses). Therefore, if the positioning axis of the
 machine has accumulative error in a direction, please check whether this
 parameter matches.

062	X feature(Rotate0 Line1)
063	Y feature(Rotate0 Line1)
064	Z feature(Rotate0 Line1)
065	4 feature(Rotate0 Line1)

Range : 0~1
 Unit : None

Authority : Super Admin
 Default : 1
 Effective time : Instant
 Note : Set axis characteristics.
 0: Rotary axis
 1: Linear axis

The setting of this parameter and P2.066~069 axis will affect the setting of P2.041~044. Please refer to the parameter description of P2.041~044 for details.

066	X Rolling Display Usage
067	Y Rolling Display Usage
068	Z Rolling Display Usage
069	4 Rolling Display Usage

Range : 0~1
 Unit : None
 Authority : Super Admin
 Default : 0
 Effective time : Instant
 Note : Set the coordinate display mode of the axis. This parameter is valid when P2.062~P2.065 is set to 0
 0: 0~360° display
 1: -9999.999~9999.999° display

The setting of this parameter and P2.062~065 axis will affect the setting of P2.041~044. Please refer to the parameter description of P2.041~044 for details.

070	X Rolling Path Optimize
...	...
073	4 Rolling Path Optimize

Range : 0~1
 Unit : None
 Authority : Super Admin
 Default : 1
 Effective time : Instant
 Note : This parameter is valid when P2.062~P2.065 and P2.066~P2.069 are set to 0; set whether looking for shortest path automatically; if it is rotary

axis and is positioning but doesn't process, enable this function to shorten the motion time.

0: Do not optimize the path

1: Enable the shortest path

Note: If processing is required during the motion, the shortest path may be not your desired processing track.

074	Max Acc of X(Kpps)
...	...
077	Max Acc of 4(Kpps)

Range : 100~8000

Unit : Kpps (Kilo Pulse Per Second)

Authority : Super Admin

Default : 2000

Effective time : Instant

Note : Set the maximum acceleration of every axis. This setting will affect the track speed optimization of pretreatment to every axis. If a high value is set, the axis response time will be shortened and characteristics of the motor will be improved according to the machine tool.

This parameter also affects the home function and limit stop function.

Hard limit function: Use hard limit in software scanning mode, in which the hard limit decelerates and stops according to the maximum acceleration of this axis. Therefore, if this value is too high, the machine tool will stop in emergency, and if this value is too low, it will cause too much overshoot.

Home function: the home acceleration of every axis uses this value.

078	X Servo Home Dir
079	Y Servo Home Dir
080	Z Servo Home Dir
081	4 Servo Home Dir

Range : 0~1

Unit : None

Authority : Super Admin

Default : 0

Effective time : Instant

Note : This parameter determines the Z phase search direction when servo Z phase enable parameter is enabled in P2.009~P2.016.

0: Positive

1: Negative

082	X Ext Home Enable
083	Y Ext Home Enable
084	Z Ext Home Enable
085	4 Ext Home Enable

Range : 0~1

Unit : None

Authority : Super Admin

Default : 1

Effective time : Instant

Note : When mechanical home mode is selected, this parameter determines whether external deceleration switch should be searched. If this parameter is set to 0, and P2.009~P2.016 (servo Z phase enable) is also set to 0, the home mode sets current point as the home directly in mechanical mode.

0: No

1: Yes

086	X Encoder LogicDir<●>
087	Y Encoder LogicDir<●>
088	Z Encoder LogicDir<●>
089	4 Encoder LogicDir<●>

Range : 0~1

Unit : None

Authority : Super Admin

Default : 0

Effective time : Instant

Note : If the logic direction obtained by the encoder is reverse to the actual motion direction of the axis, please set this parameter.
Handwheel encoder reuses A axis encoder.

Principal axis encoder reuses X axis encoder.

0: Positive

1: Negative

090	X HomeSpeed2
091	Y HomeSpeed2
092	Z HomeSpeed2
093	4 HomeSpeed2
094	X HomeSpeed3
095	Y HomeSpeed3
096	Z HomeSpeed3
097	4 HomeSpeed3

Range : 1~20000

Unit : mm/min

Authority : Super Admin

Default : 100, 60

Effective time : Instant

Note : Used to set the speed parameters of mechanical resetting; the specific effective sequence follows:

Resetting speed —> (when detecting external zero switch)
deceleration —> scanning speed

100	Hand wheel encoder dir
-----	------------------------

Range : 0~1

Unit : None

Authority : Super Admin

Default : 0

Effective time : Instant

Note : When the logic direction obtained by handheld box encoder is reverse to the actual motion direction of the axis, set this parameter to perform in-phase setting.

0: positive direction

1: negative direction

101	X restrain acc (mm/s ²)
102	Y restrain acc (mm/s ²)
103	Z restrain acc (mm/s ²)
104	4 restrain acc (mm/s ²)
105	X max restrain rate
106	Y max restrain rate
107	Z max restrain rate
108	4 max restrain rate

Range : 1~90000

Unit :

Authority : Super Admin

Default : 90000

Effective time : Instant

Note : 1. Used to configure the restriction acceleration of every axis during pretreatment processing.

2. No matter which parameter, the lower the setting is, the slower the processing speed is; vice versa.

3. The setting value should be as high as possible if each axis permits.

4. In comprehensive parameter P1.58 (interpolation speed mode), this parameter is valid if it is set to 1; the default setting is invalid.

109	X lock brake signal enable
-----	----------------------------

Range : 0~1

Unit : None

Authority : Super Admin

Default : 0

Effective time : Instant

Note : Used for mechanical system control, such as heavy load.

0: Invalid

1: On

110	Y lock brake signal enable
-----	----------------------------

	Range : 0~1 Unit : None Authority : Super Admin Default : 0 Effective time : Instant Note : Used for mechanical system control, such as heavy load. 0: Invalid 1: On
111	Z lock brake signal enable Range : 0~1 Unit : None Authority : Super Admin Default : 0 Effective time : Instant Note : Used for mechanical system control, such as heavy load. 0: Invalid 1: On
112	4 lock brake signal enable Range : 0~1 Unit : None Authority : Super Admin Default : 0 Effective time : Instant Note : Used for mechanical system control, such as heavy load. 0: Invalid 1: On
113	X lock brake delay time
114	Y lock brake delay time
115	Z lock brake delay time
116	A lock brake delay time
	Range : 0~10000 Unit : ms Authority : Super Admin Default : 0 Effective time : Instant Note : When system brake enable is turned on and each axis outputs brake signal, the system sends the pulse signal after delayed by this parameter, in order to ensure that the cylinder motion controlled by the brake signal responds normally.

10.4. Management parameter (P3.)

001	Select SupMode
002	AlterSuperuserPassword
003	Alter User Password

Range : None

Unit : None

Authority : None

Default : None

Effective time : Instant

Note : Set system permissions, including super user, operator and user, of which super user has the highest permissions, the operator only has part of the setting permission, and the user can not modify any system settings. The default option is super user. If you set a super user password, the system automatically switches to operator permission after restarted next time. If you set an operator password, the system switches to user permission after restarted. The default password of super user and operator is 0.

1. In this menu, press 'EOB' and select permission in the pop-up dialog box, and then input the user password again to switch to select the permission;

2. Super user can modify the super user password and operator password, select the option to modify and press EOB, and input the old and new password in the pop-up dialog box.

Note: the initial password is 0.

004	Initialize
005	Initialize IO Config
006	all para reset<●>

Range : None

Unit : None

Authority : Super user

Default : None

Effective time : Instant

Note : Initial parameter table only in super user mode. After initialized, the parameters will be reset to default. Please back up the parameters before initializing to avoid repeated setting.

007	para backup
008	para recover
	Range : None Unit : None Authority : Super user Default : None Effective time : Instant Note : 1. The parameters are backed up and restored only in super user mode. 2. The parameters are backed up to the sysconf.bak file in the root directory of the controller. If this folder already has a file with same name, the latest backup will overwrite this file. If the parameters are same, the backup file can be copied to other systems for restoration. 3. The sysconf.bak file in the root directory is also used for restoring. 4. After adjusting, please back up the parameters to avoid parameters being modified. 5. After restoring, the system will restart automatically.
009	generate cryptogram
	Range : None Unit : None Authority : None Default : None Effective time : Instant Note : If you have forgotten the password, you can generate a PassMeg.DAT file with this function, provide this file to controller manufacturer and ask the manufacturer to reset the password.
010	menu click way
	Range : 0~1 Unit : None Authority : None Default : 0 (click) Effective time : Instant Note : This function is to be developed
011	clear add up work num
012	clear current work num
	Range : None

Unit : None

Authority : None

Default : None

Effective time : Instant

Note : Clear the accumulated value of current processing pieces. The accumulated processing pieces are saved after power failure, and the current processing pieces are cleared after the system is restarted.

013

lead in CSV sys config

Range : None

Unit : None

Authority : None

Default : None

Effective time : Restart

Note : Import the CSV system configuration of the manufacturer into the system. Please refer to the configuration of macro variables and tool magazine parameters for specific method.

014

startup display module

Range : Select

Unit : None

Authority : Operation admin

Default : ABS

Effective time : Instant

Note : Select default boot screen from absolute position, relative position and comprehensive position.

015

sys language bag

Range : 0~1

Unit : None

Authority : Operation admin

Default : 0 (Chinese)

Effective time : Instant

Note : Select system language

Chinese

English

016

macro key word valid En

Range	:	0~1
Unit	:	None
Authority	:	Operation admin
Default	:	0 (Chinese)
Effective time	:	Instant
Note	:	Macro keyword effective parameter is used to set whether the macro expression symbol on the membrane is valid (1: valid, 0: invalid). Generally, turn on this parameter while writing macro program, and then input operators in number section.

017

startup picture display

Range	:	0~6
Unit	:	None
Authority	:	Operation admin
Default	:	1S
Effective time	:	Instant
Note	:	Used to configure the display mode of the logo; if it is set to 0, the user needs to press any key to enter the system; for any other value, the system delays for corresponding time, and enters automatically.

018

sys display axis setting

Range	:	
Unit	:	None
Authority	:	Super user
Default	:	XYZ
Effective time	:	Instant
Note	:	Used to configure the display axis of current system, and different display combinations are available.

This configuration only determines the content of the interface. If the axis function of the hardware exists, it still can output axis control during programming, but the axis status won't be displayed. The status such as axis limit and alarm will be ignored.

019

sys debug information En

Range	:	0~1
Unit	:	None
Authority	:	Super user
Default	:	OFF/0
Effective time	:	Instant
Note	:	Used to configure whether RS232 of current system outputs the testing

info while program is running.

This parameter is dedicated for programmers, and the users are not suggested using this parameter.

If the testing info is enabled, the system performance will be lowered, and therefore it is disabled during normal processing.

If networking is enabled, this function must be disabled, or else the networking will fail.

020

axis control composite

Range : 0~1
 Unit : None
 Authority : Super user
 Default : ON/1
 Effective time : Instant
 Note : Used to configure whether the key for axis motion on the control panel is enabled.

This parameter is used to shield the composite function of the key for axis motion on the NC panel and reduce the possibility of misoperation when additional panel is used. However, if no additional panel is used, this parameter must be enabled, or else the axis motion can't be controlled through the key.

021

additional panel enable

Range : 0~1
 Unit : None
 Authority : Super user
 Default : OFF/0
 Effective time : Instant
 Note : Used to configure whether NC uses additional panel, which must be ADT matching additional panel, or compatible with the interface of same protocol.

If additional panel is used, the system testing info enable must be deactivated (P3.19).

022

M macro program selection<●>

Range : MFUNC(M), User-Def
 Unit : None

Authority : Super user
 Default : MFUNC(M)
 Effective time : Instant
 Note : Used to configure the auxiliary control of the system by calling M_FUNC.NC or not. Through M_FUNC.NC file, the user can custom M code function and panel control function. If this parameter is set to User-Def, specific functions can be achieved through M_FUNC.NC program file under D:\MACRO directory.

023

T macro program selection<●>

Range : TFUNC(M), User-Def
 Unit : None
 Authority : Super user
 Default : TFUNC(M)
 Effective time : Instant
 Note : This parameter can be used to define the tool magazine program. TFUNC (M) is the built-in tool magazine program of the system. If this parameter is set to User-Def, the tool magazine function can be achieved by writing M_FUNC.NC under D:\MACRO directory.

024

PLC program selection<●>

Range : PLC(M), User-Def
 Unit : None
 Authority : Super user
 Default : PLC(M)
 Effective time : Instant
 Note : Used to configure the auxiliary control of the system by calling PLC (M). NC or not.

025

Screen saver on

Range : 0&1
 Unit : None
 Authority : Super user
 Default : 0
 Effective time : Instant
 Note : Used to configure whether turn on screen saver of the system, in order to further reduce system power consumption.

If the parameter is set to 1, the screen display will automatically turn off after one minute when the system is stopped.

10.5. Tool magazine parameters (P4.)

001	Current tool number
	Range : 0~10000 Unit : None Authority : Operation admin or higher Default : 0 Effective time : Instant Note : Current tool number on the spindle;
002	System cutter
	Range : 0~10000 Unit : None Authority : Operation admin or higher Default : Effective time : Instant Note : The number of tool magazine, used to limit tool change and prevent beyond the value during processing
003	ATC reference position X (mm)
	Range : -9999~9999 Unit : Mm Authority : Operation admin or higher Default : 0.000 Effective time : Instant Note : The reference position on the X-axis direction in straight tool magazine; if the straight tool is mounted on the X-axis direction, this parameter can be used, typically the position of the first tool, other tools are calculated with respect to the reference tool position and interval. The default configuration of the system is straight tools installed on the X axis.
004	ATC reference position Y (mm)
	Range : -9999~9999 Unit : Mm Authority : Operation admin or higher Default : 0.000 Effective time : Instant Note : The reference position on the Y-axis direction in straight tool magazine; if the straight tool is mounted on the Y-axis direction, this parameter can be used, typically the position of the first tool, other tools are calculated with respect to the reference tool position and interval.
005	ATC reference position Z (mm)
	Range : -9999~9999 Unit : Mm Authority : Operation admin or higher Default : 0.000

Effective time : Instant

Note : The reference position on the Z-axis direction in straight tool magazine; if the straight tool is mounted on the Z-axis direction, this parameter can be used, typically the position of the first tool, other tools are calculated with respect to the reference tool position and interval.

006

ATC safety height (mm)

Range : -9999~9999

Unit : Mm

Authority : Operation admin or higher

Default : 0.000

Effective time : Instant

Note : Safe height of tool change, which should consider the longest tool holder in the tool magazine before setting this parameter. Make sure that there is no position interference.

007

ATC high speed (mm/min)

Range : -9999~9999

Unit : Mm

Authority : Operation admin or higher

Default : 0.000

Effective time : Instant

Note : The speed that each axis quickly locates the set position when tool is changed. For example, if safe height is located, the safe position use this speed.

008

ATC low speed (mm/min)

Range : -9999~9999

Unit : Mm

Authority : Operation admin or higher

Default : 0.000

Effective time : Instant

Note : The speed that each axis slowly locates the set position when tool is changed. This parameter is used when taking and placing the tool.

009

Quick decline position (mm)

Range : -9999~9999

Unit : Mm

Authority : Operation admin or higher

Default : 0.000

Effective time : Instant

Note : This parameter is reserved. Current straight tool doesn't use this parameter. You can use this parameter in customized tool magazine macro program.

010

Tool placing position (mm)

Range : -9999~9999

Unit : Mm
 Authority : Operation admin or higher
 Default : 0.000
 Effective time : Instant
 Note : This parameter is reserved. Current straight tool doesn't use this parameter. You can use this parameter in customized tool magazine macro program.

011

Tool cutting position (mm)

Range : -9999~9999
 Unit : Mm
 Authority : Operation admin or higher
 Default : 0.000
 Effective time : Instant
 Note : This parameter is reserved. Current straight tool doesn't use this parameter. You can use this parameter in customized tool magazine macro program.

012

Spindle air blow hold time (ms)

Range : -9999~9999
 Unit : Mm
 Authority : Operation admin or higher
 Default : 0.000
 Effective time : Instant
 Note : This parameter is reserved. Current straight tool doesn't use this parameter. You can use this parameter in customized tool magazine macro program.

013

X-safe position after tool change (mm)

Range : -9999~9999
 Unit : Mm
 Authority : Operation admin or higher
 Default : 0.000
 Effective time : Instant
 Note : The safe position that X-axis returns to after taking and placing the tool for the tool magazine installed on the Y-axis

014

Y-safe position after tool change (mm)

Range : -9999~9999
 Unit : Mm
 Authority : Operation admin or higher
 Default : 0.000
 Effective time : Instant
 Note : The safe position that Y-axis returns to after taking and placing the tool for the tool magazine installed on the X-axis; the default configuration of the system is straight tool mounted on the X axis.

015	Tool spacing (mm)
	Range : 0~9999
	Unit : Mm
	Authority : Operation admin or higher
	Default : 0.000
	Effective time : Instant
	Note : The distance between two tools of straight tool magazine, the system calculates the position of other tools according to the reference position and spacing.
016	Vertical-type position offset (mm)
	Range : -9999~9999
	Unit : Mm
	Authority : Operation admin or higher
	Default : 0.000
	Effective time : Instant
	Note : This parameter is reserved. Current straight tool doesn't use this parameter. You can use this parameter in customized tool magazine macro program.

10.6. Principal axis parameter (P5.)

001	Spi.Alarm ELevel
002	Spi.Reset ELevel
003	Spi.ECZ Home Enable
004	Spi.ECZ Elevel
005	Spi. Limit+ Enable
006	Spi. Limit- Enable
007	Spi.Limit Elevel
008	Spi.Pulse Mode
009	Spi.Pulse Logic Mode
010	Spi.HomeDect ELevel
011	Spi.ExtHome Check En
012	Spi.Round Setting
014	Spi.ZeroOffset(p)
015	Spi.PulseLogic Level
016	Spi.Rolling Display Usage

017	Spi.Max Acc(Kpps)
018	Spi.Ext HomeDir
019	Spi.Servo HomeDir
021	Spi.Home Speed(rpm)

Range : 0~1
 Unit : Logic level
 Authority : Operation admin or higher
 Default : 0
 Effective time : Instant
 Note : Servo principal axis parameters are same as common positioning axis parameters. If only the principal axis is controlled with servo port, you can set the number according to axis parameters.

013	Spi.Encode bits(p)
-----	--------------------

Range : 64~9999
 Unit : None
 Authority : Operation admin or higher
 Default : 2500
 Effective time : Instant
 Note : The received wire number of the encoder when the principal axis rotates one circle;

Same as common axis encoder, it can only receive AB phase pulse, and thus the wire number of the encoder must be pulses of one circle divided by 4.

This parameter will affect G74 and G84 tap instructions. Please set it properly.

020	Spi.Max Speed(rpm)
-----	--------------------

Range : 1~30000
 Unit : None
 Authority : Operation admin or higher
 Default : 24000
 Effective time : Instant
 Note : This setting is used to calculate the analog output of the controller, and suppose that the analog of variable frequency control is in linear control mode;

This method is to set the rotation to this parameter according to the variable frequency rotation corresponding to analog 10V, and transfer

the rotation directly later, while the controller will output corresponding analog voltage according to linear scale automatically.

022	Spi.Gear Numerator
023	Spi.Gear Denominator
	Range : 1~65535 Unit : None Authority : Operation admin or higher Default : 1 Effective time : Instant Note : If the principal axis has gear position, please set the hardware gear ratio to this parameter, which hasn't been used in standard version, but may be used in certain special conditions.
024	Spi.Encoder Logic Dir
	Range : 0~1 Unit : None Authority : Operation admin or higher Default : 0 Effective time : Instant Note : The direction of rotation of the spindle encoder.
025	Spi.OpenDelayTime(ms)
	Range : 0~9000 Unit : Ms Authority : Operation admin or higher Default : 6000 Effective time : Instant Note : Set the delay time through this parameter to start the spindle. The parameter is mainly to prevent processing before the spindle is started.
026	Servo spindle ready level
027	Servo spindle quasi stop in-place level
028	Servo spindle zero speed in-place level
029	Servo spindle speed arrival level
	Range : 0~1 Unit : None Authority : Operation admin or higher

Default : 0
 Effective time : Instant
 Note : These parameters are reserved for the system.

030	System spindle speed
Range	: 1~24000
Unit	: None
Authority	: Operation admin or higher
Default	: 100
Effective time	: Instant
Note	: Set spindle speed S value of the system. If the user program uses one spindle for speed processing, set the desired spindle speed, and the spindle code doesn't need to be written in the program. If the program has spindle code, the system will perform the programming speed and save in parameters.
031	If close spindle while executing M30
Range	: 0~1
Unit	: None
Authority	: Operation admin or higher
Default	: 1
Effective time	: Instant
Note	: This parameter sets whether to automatically open and close the spindle when the program automatically starts and ends. If set to 1, the spindle automatically closes before started, and automatically stops during operation; after started, the spindle automatically opens.

10.7. Port configuration (P6.)

001	Wheel0.1----- Input wire No.
...	...
014	A Alarm----- Input wire No.
Range	: 24~37
Unit	: None
Authority	: Super Admin
Default	: The port table in the manual
Effective time	: Instant
Note	: Handheld box interface and servo alarm function pin definition;

Servo alarm input port, handheld box position, axis selection, start, pause, and emergency stop input port can be configured. The default handheld box testing port is XS7, and servo alarm detection port is XS1~XS4.

015	IN0----- Input wire No.
...	...
038	IN23----- Input wire No.

Range : 1~24
 Unit : None
 Authority : Super Admin
 Default : The port table in the manual
 Effective time : Instant
 Note : Input terminal No. configuration parameter

Terminal No. is the object of the system to control IO, e.g. X external home signal test, and the system tests terminal No. IN0, which corresponds to input wire 1 by default, and thus the system tests input pin1 indirectly; by default, the terminal No. is assigned to wire No. according to the IO relationship in the manual; however, this relationship isn't constant, and you can specify in these parameters and reassign a terminal No. to any input port;

For example, if you set 10 in parameter 042, the system will test pin 10 instead of pin 1 when it tests X home signal during home operation.

039	OUT0----- Output wire No.
...	...
062	OUT23----- Input wire No.

Range : 1~24
 Unit : None
 Authority : Super Admin
 Default : The port table in the manual
 Effective time : Instant
 Note : Output terminal No. configuration is same as input terminal configuration. Output terminal No. and wire No. are mapped

063	Safe Signal
-----	-------------

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : =====
 Effective time : Instant

Note : Specified system safety signal detection port, the system default is null. If safety signal detection port is set, the system will generate security alarm if signal is detected in running state. To cancel this function, enter "8888" and change to "===== ". The port can be used for other functions. Please note that a universal port between 0 and 23 is input. For example, to specify pin 10, enter 9 and the parameter becomes "IN (9)".

064	PressureDect Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Configure air pressure signal detection port. If the signal is detected after port is configured, air pressure alarm is generated. The default configuration is No.
065	ChuckDectect Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Configure system chuck alarm detection port. The chuck signal is detected in running state, which is same as safety signal.
066	SysOilOut Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Configure the system pump output port. The system default is null. This parameter specifies the oil pump port controlled by general parameter 069~072.
067	TChecking signal Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Configure tool checking signal detection port. The default is null. This parameter can be configured in the machine using tool setter.
068	AlarmLight Out Port

	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for system alarm status output port configuration; the default setting is null.
069	RunLight Out Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for system alarm status output port configuration; the default setting is null.
070	VFD 0 Level Out Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for spindle speed control, corresponding to X0 input port of the inverter
071	VFD 1 Level Out Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for spindle speed control, corresponding to X1 input port of the inverter
072	VFD 2 Level Out Port Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for spindle speed control, corresponding to X2 input port of the inverter
073	VFD 3 Level Out Port Range : 0~23 Unit : None

Authority : Operation admin or higher
 Default : =====
 Effective time : Instant
 Note : Used for spindle speed control, corresponding to X3 input port of the inverter

074

Oiling Out Port

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : OUT (05)=
 Effective time : Instant
 Note : Used for oil output port configuration; the default value is 05

075

Cooler Out Port

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : OUT (04)=
 Effective time : Instant
 Note : Used for cooler output port configuration; the default value is 04

076

Spindle CW Out Port

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : OUT (00)=
 Effective time : Instant
 Note : Used for spindle CW output port configuration; the default value is 00

077

Spindle CCW Out Port

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : OUT (01)
 Effective time : Instant
 Note : Used for spindle CCW output port configuration; the default value is 01

078

System OilDect Port

Range : 0~23
 Unit : None
 Authority : Operation admin or higher
 Default : =====
 Effective time : Instant
 Note : Used for hydraulic pressure detection with auxiliary hydraulic control; the default value is null

079

SpindleAlarm DetectPort

	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for input detection port configuration of spindle alarm signal; the default value is null; used together with parameter 069~072
080	Transduser DetectPort Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for input detection port configuration of inverter alarm signal; the default value is null.
081	ExScram2 DetectPort Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for port configuration of external emergency stop input signal; the default value is null.
082	Air of ToolCheck OutPort Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for output port configuration of tool setter blowing; before tool setting, blow the debris to ensure the tool setting accuracy; the default value is null.
083	IO Conf in RESET 00~15 Range : 0~65535 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the output signal that should be reset. For example, to reset output port of pin 10# when the system is reset or alarms, press EOB and set OUT9 in the pop-up dialog box (black dot is selected), press and hold EOB for three seconds to exit.

084	IO Conf in RESET 16~23
	Range : 0~65535
	Unit : None
	Authority : Operation admin or higher
	Default : =====
	Effective time : Instant
	Note : The output signal that the system needs to reset when configuring reset and alarm; the configuration is OUT16~OUT23.
085	ExStart2 DetectPort
	Range : 0~23
	Unit : None
	Authority : Operation admin or higher
	Default : =====
	Effective time : Instant
	Note : Used to configure external start button wiring port; the default value is null
086	ExPause2 DetectPort
	Range : 0~23
	Unit : None
	Authority : Operation admin or higher
	Default : =====
	Effective time : Instant
	Note : Used to configure external start button wiring port; the default value is null
087	TCheck Limit DetectPort
	Range : 0~23
	Unit : None
	Authority : Operation admin or higher
	Default : =====
	Effective time : Instant
	Note : Used to configure external tool setter limit signal port; the default value is null
088	Servo spindle enable output port No.
	Range : 0~23
	Unit : None
	Authority : Operation admin or higher
	Default : =====
	Effective time : Instant
	Note : Used to configure servo spindle enable control port; the default value is null. After the system specifies servo spindle function, the servo enable pin can be controlled through this parameter
089	Servo spindle quasi stop output port No.

	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure servo spindle stop detection port; the default value is null. In tool magazine, if spindle stop is required, start spindle stop command, and determine whether stop in place by detecting spindle stop port
090	Servo spindle pulse control output No. Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the switch port of servo spindle pulse control mode; the default value is null. Used when servo spindle is specified.
091	Servo spindle rigid tapping output No. Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the servo spindle rigid tapping control output port; the default value is null. Current version is not used.
092	Servo spindle ready input No. Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure servo spindle ready input port; the default value is null.
093	Servo spindle quasi stop input port No. Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the servo spindle stop in-place input port; the default value is null. Current version is not used.
094	Servo spindle zero speed in-place input port No.

	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the servo spindle zero-speed in-place input port; the default value is null. Current version is not used.
095	Servo spindle speed arrival input port No. Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used to configure the servo spindle speed arrival input port; the default value is null. Current version is not used.
096	Reset off LED configuration 0-31 Range : 0~65535 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Whether to turn off the LED for alarm or system reset, same as IO reset configuration. LED0~LED31 correspond to LED lights on the controller and additional panel.
097	Reset off LED configuration 32-63 Range : 0~65535 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Whether to turn off the LED for alarm or system reset, same as IO reset configuration. LED0~LED31 correspond to LED lights on the controller and additional panel.
099	X lock brake output port
100	Y lock brake output port

101	Z lock brake output port
101	4 lock brake output port
	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Configure brake signal output port; the default value is null. Brake enable is set in axis configuration parameters. After brake function is configured, if the corresponding axis has pulse signal output, it will output brake signal, and turn off brake signal if there is no pulse output.
102	Spindle frequency alarm reset port
	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for spindle inverter alarm clear port configuration; the default value is null.
103	Cooler alarm detection port
	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for cooler alarm input port configuration; the default value is null.
104	External reset input port
	Range : 0~23 Unit : None Authority : Operation admin or higher Default : ===== Effective time : Instant Note : Used for external reset button input port configuration; the default value is null.
105	Elastic cutter input port
	Range : 0~23 Unit : None Authority : Operation admin or higher Default : =====

Effective time : Instant
 Note : Configure spindle elastic cutter detection port, and control elastic cutter signal via external switch signal.

106

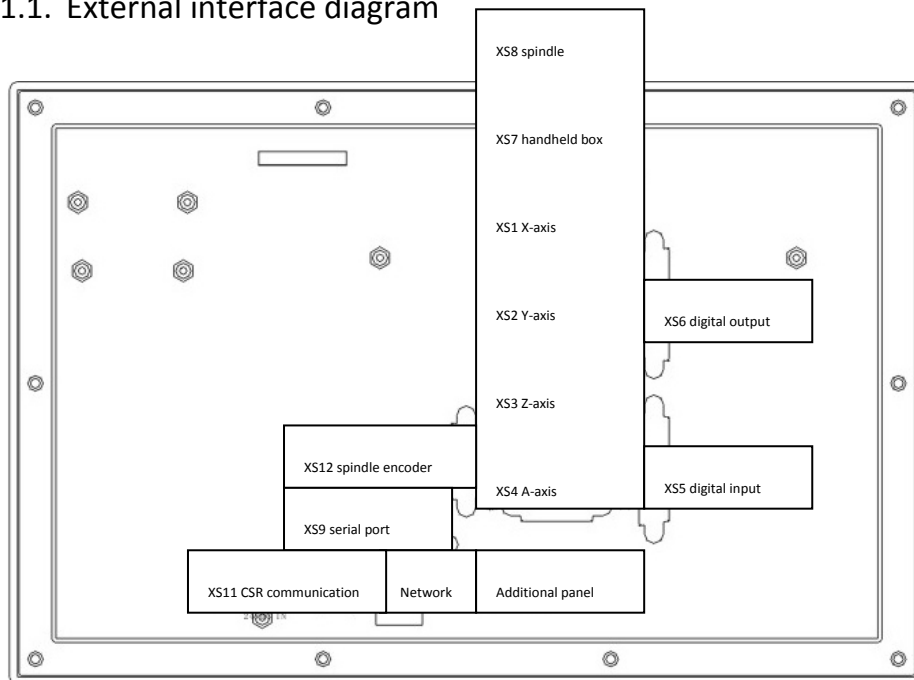
Spindle air blow output port

Range :
 Unit : None
 Authority : Operation admin or higher
 Default : =====
 Effective time : Instant
 Note : Used for spindle air blow output port configuration; the default value is null.

11. Hardware interface definition and connection instructions

11.1. Installation layout

11.1.1. External interface diagram



(1) X axis, Y axis, Z axis, A axis:

15-core D-pin socket connects to step motor drive or digital AC servo drive

(5) XS5 digital input:

25-core D-pin socket inputs signals for every axis limit and other switching quantity

(3) XS6 digital output:

25-core D-pin socket outputs signals for switching quantity

(5) USB and serial port exchange files between PC and DK300A controller and realize other functions.

(5) DK300A controller uses 24V DC power supply, and the internal power consumption is about 5W.

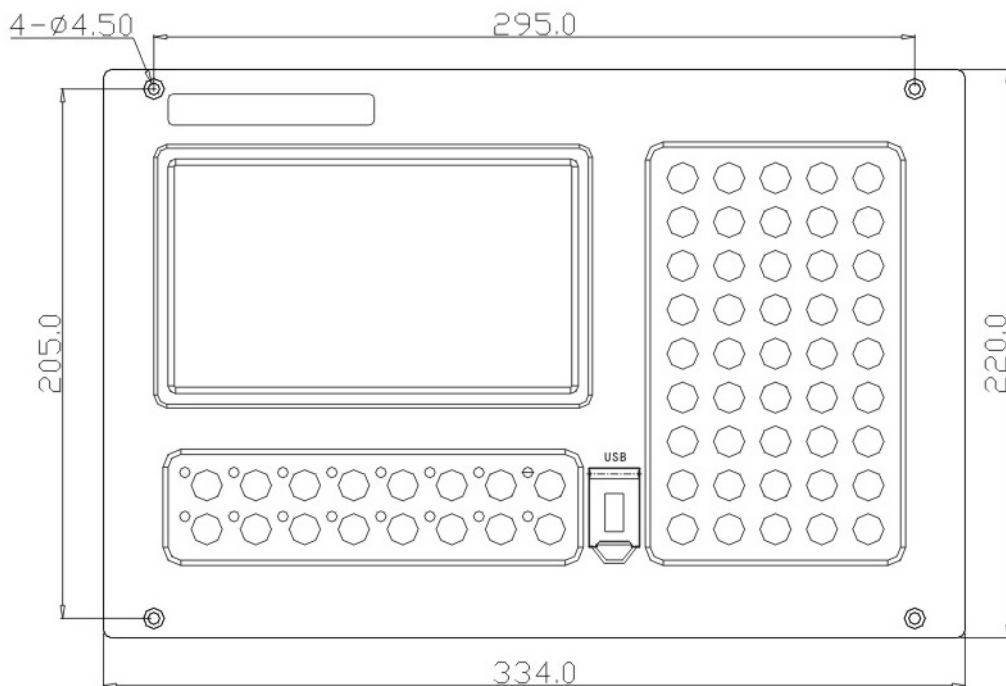
(6) XS7 accessory panel:

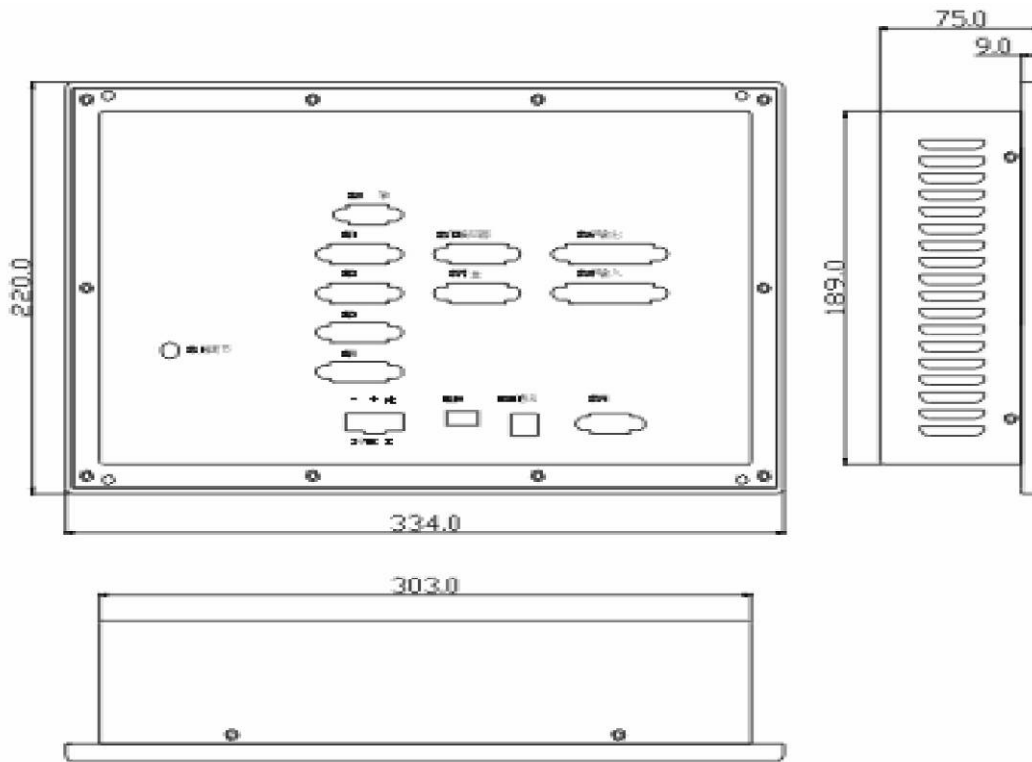
15-core D-pin socket connects to handwheel

(7) XS8 principal axis:

9-core D-pin socket connects to principal axis inverter

11.1.2. Mounting dimensions





11.1.3. Installation precautions

Installation condition for electric cabinet

- (1) The cabinet must be able to effectively prevent dust, coolant and organic solution entering;
- (2) When design electric cabinet, the distance between rear cover and case should be at least 20CM; considering the temperature rises in the cabinet, the temperature difference between interior and exterior of the cabinet shouldn't exceed 10°C;
- (3) The cabinet should be installed with fan to ensure interior ventilation;
- (4) The display panel should be installed at the position can't be sprayed by the coolant;
- (5) When design electric cabinet, the external electrical interference should be reduced to lowest to prevent interfering with the system;

To prevent interference

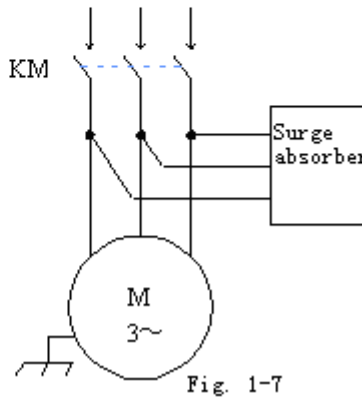
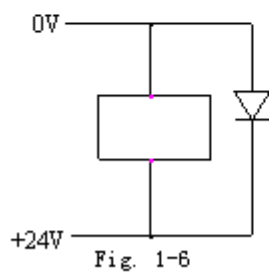
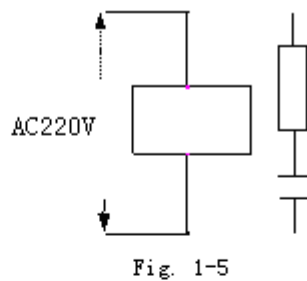
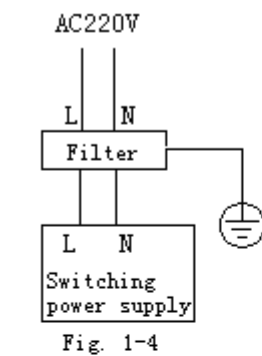
The system is designed with anti-interference measures such as shielding space electromagnetic radiation, absorbing impact current and filtering power clutter, which can prevent interference with the system in certain degree. To ensure system stability, please take the following measures to install and connect the system:

(1) CNC must be kept away from the equipment with interference (e.g. inverter, AC contactor, electrostatic generator, high voltage generator, and sub-unit of power lines), and the switching power supply should be connected to a filter to improve the anti-interference of CNC (as in Fig.1-4);

(2) To supply power to the system through isolation transformer, the machine tool must be grounded, CNC and drive must be connected to separate earth wire.

To suppress interference

Connect RC circuit ($0.01\mu\text{F}$, $100\sim 200\Omega$, as in Fig. 1-5) to both sides of AC coil in parallel. RC circuit should be installed close to inductive load; connect freewheeling diode reversely on both sides of DC coil in parallel (as in Fig.1-6); connect surge absorber to the winding of AC motor in parallel (as in Fig. 1-7).



To reduce the interference between CNC signal cables and strong current cables, the wiring shall follow the principles below:

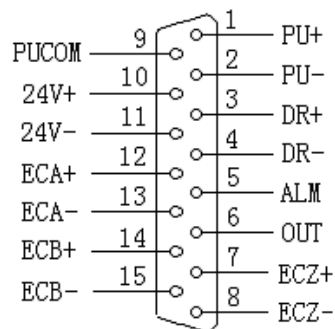
Group	Cable type	Wiring requirements
A	AC power cord	Bundle the cables of group A separately from group B and C, keep at least 10cm clearance, or make electromagnetic shielding for group A
	AC coil	

	AC contactor	
B	AC coil (24VDC)	Bundle the cables of group B separately from group A or shield group B; group B and group C should be as far as possible
	DC relay (24VDC)	
	Cable between system and strong current cabinet	
	Cable between system and machine tool	
C	Cable between system and servo drive	Bundle the cables of group C separately from group A, or shield group C; keep at least 10cm clearance between group C and group B and use twisted pair
	Position feedback cable	
	Position encoder cable	
	Handwheel cable	
	Other cables for shielding	

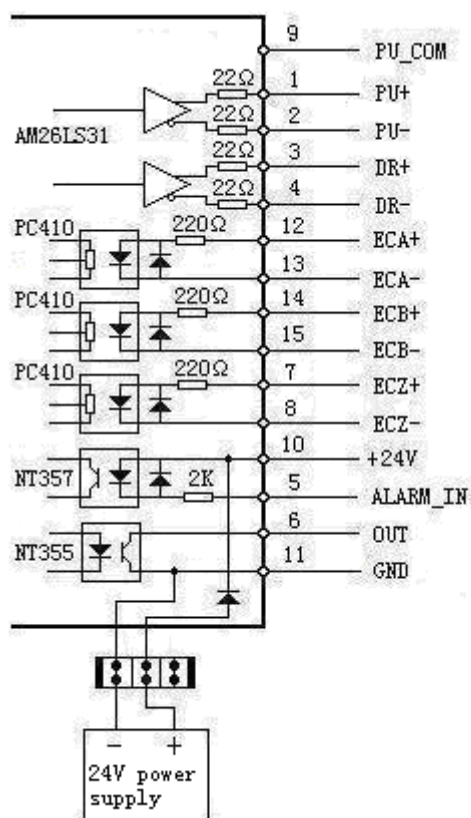
11.2. Interface definition

11.2.1. Motor drive control interface (XS1...XS4)

Four drive interfaces are available (XS1 X axis, XS2 Y axis, XS3 Z axis, XS4 A axis), and they have the same definition, as shown below:



Pulse wire connection

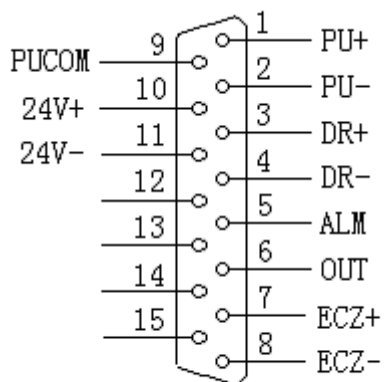


Simple Internal Circuit Diagram for Pulse Output

Wire No.	Definition	Function
1	PU+	Pulse signal +
2	PU-	Pulse signal -
3	DR+	Direction signal +
4	DR-	Direction signal -
5	ALM	Servo alarm signal input X axis: IN34, Y axis: IN35, Z axis: IN36, A axis: IN37
6	OUT	Axis alarm reset output signal X axis: OUT24, Y axis: OUT25, Z axis: OUT26 A, axis: OUT27
7	ECZ+	Encoder phase Z input +

8	ECZ-	Encoder phase Z input -
9	PUCOM	Controller for single end input
10	24V+	Internally provided 24V power supply, directly connected to 24V power supply of the controller
11	24V-	
12	ECA+	Encoder phase A input +
13	ECA-	Encoder phase A input -
14	ECB+	Encoder phase B input +
15	ECB-	Encoder phase B input -

Standard pulse wiring diagram

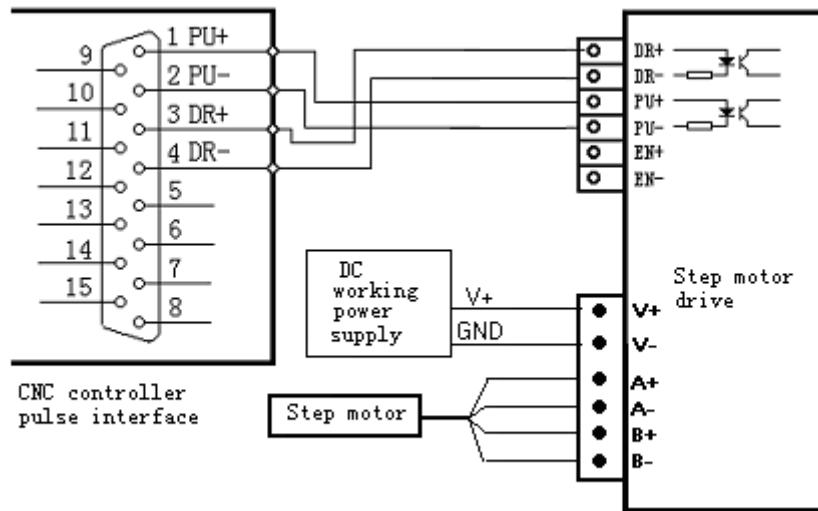


XS1 ... XS4 Pulse Interfaces Standard Wiring

This wiring is suitable for DK300A/400A controller;

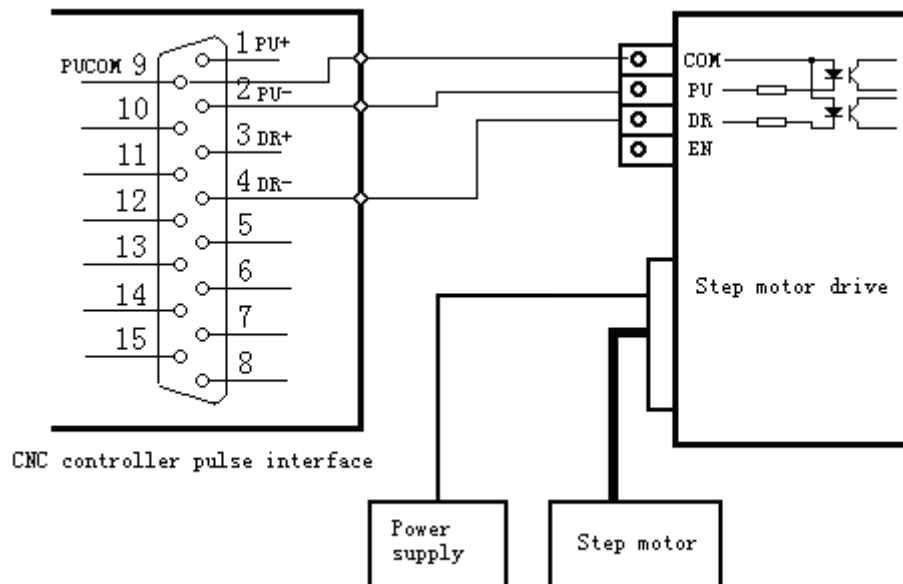
Step motor drive cable to differential input

Adtech CNC drive is for reference, all of which use differential input mode. This mode has strong anti-interference and is recommended. Please refer to the figure below for the connection of CNC with step motor drive and step motor



Step motor drive wiring diagram for single-ended input

Certain companies connect together the optocoupler input cathodes of step drives, i.e. common cathode connection, which isn't suitable for CNC controller. Common anode connection connects together the anodes of optocoupler input. The wiring shall follow the figure below, and do not connect PU+ and DR+ together, or else the pulse interface may be damaged.



Wiring Diagram for Step Motor Drive with Common Anode Input

Servo motor drive wiring diagram

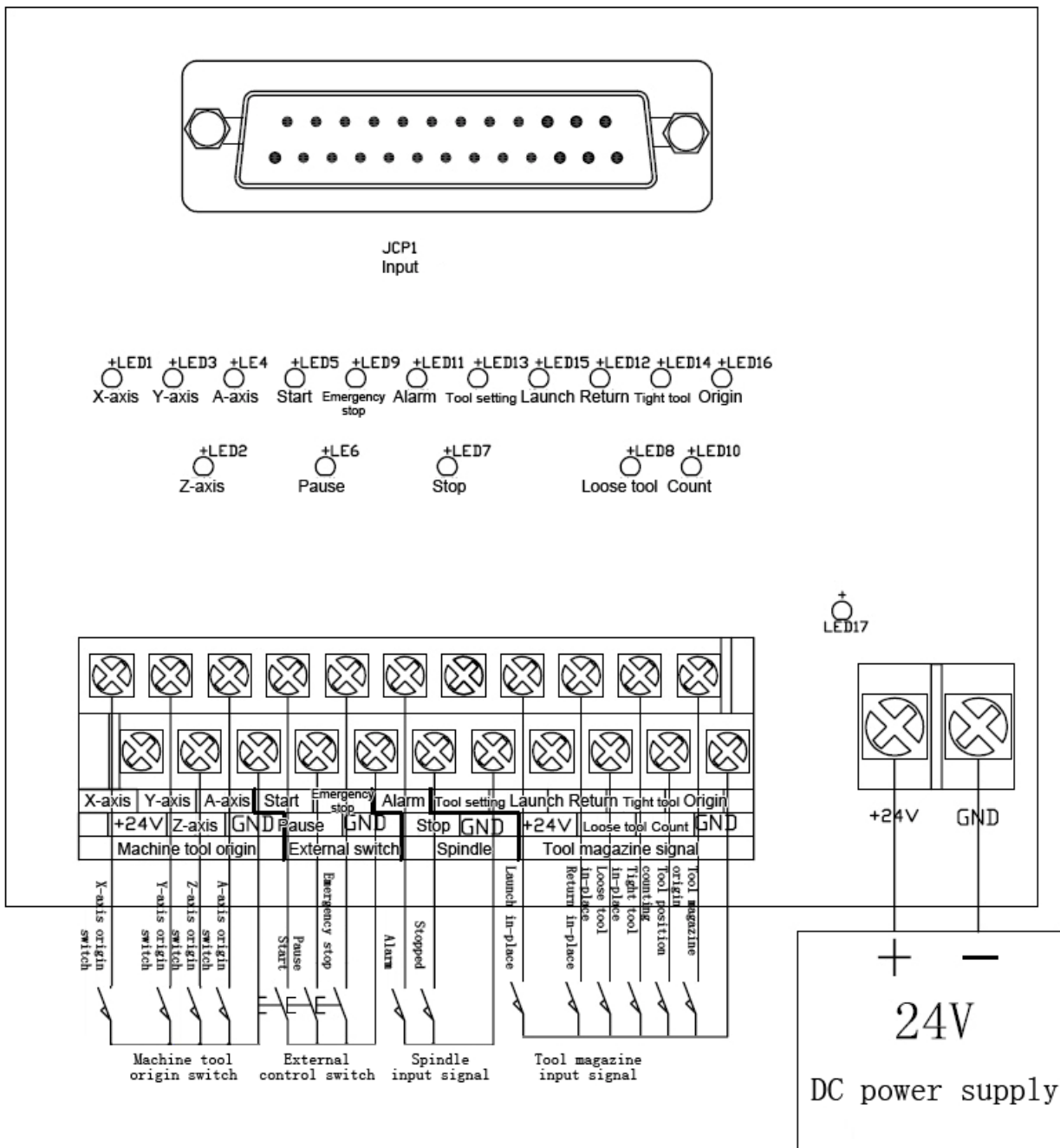
Since differential connection is used in most cases, please refer to differential mode for the pulse connection. Most servo drives require 12-24V power supply, and the 24V power provided by pin 10, 11 is available. The specific connection depends on servo drive. Please contact us if you have any question.

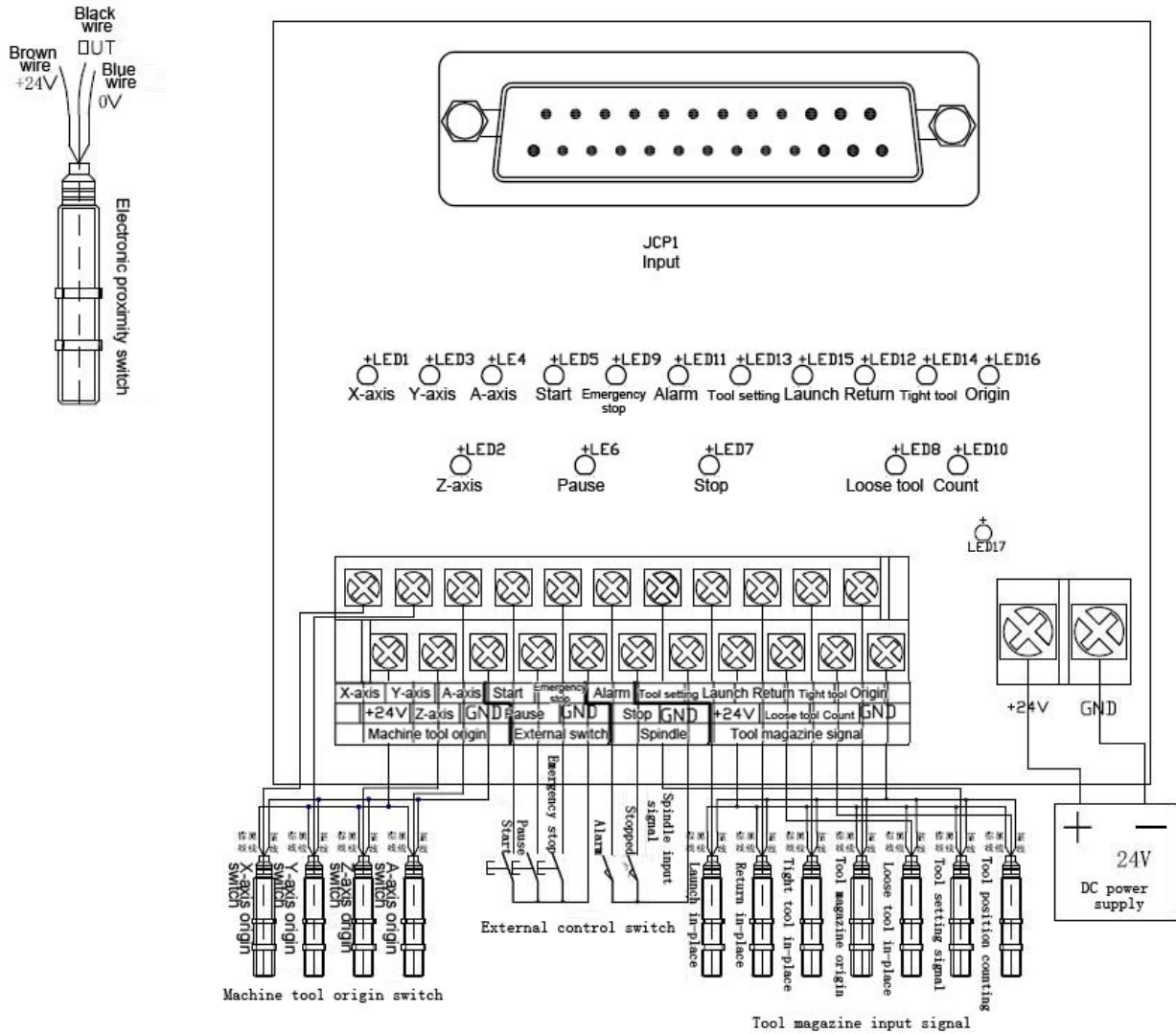
Caution

Either two of PU+, PU-, DR+ and DR- shouldn't be connected, or else the pulse interface may be damaged.

11.2.2. Digital input interface (XS5)

The digital input interface contains the hard limit signal of every axis, and the definition follows:



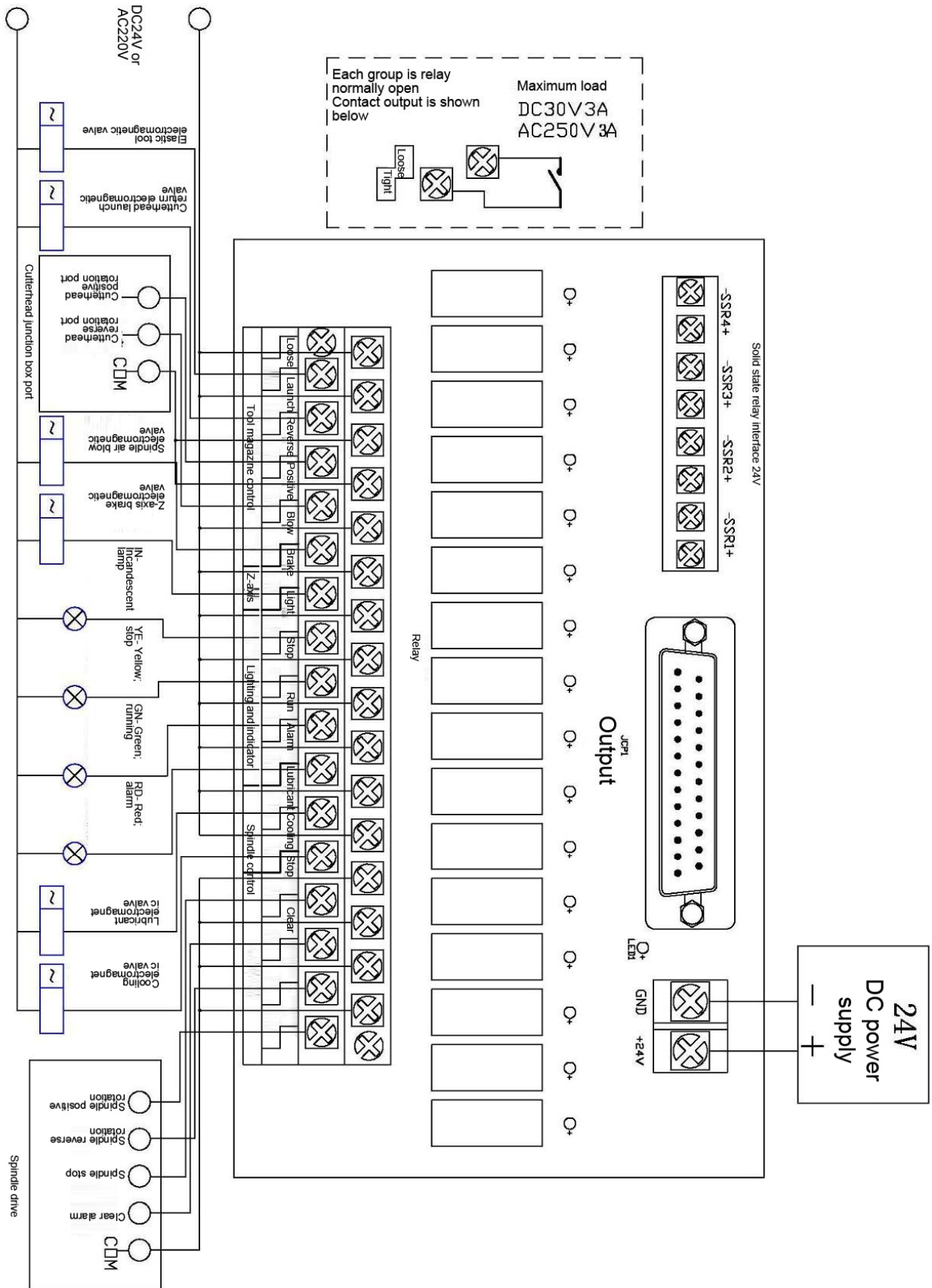


Default input port configuration of engraving machine

Wire No.	Definition	Function
1	IN0	X axis zero point
2	IN1	Y axis zero point
3	IN2	Z axis zero point
4	IN3	A axis zero point
5	IN4	Start

6	IN5	Pause
7	IN6	Emergency stop
8	IN7	Spindle alarm input
9	IN8	Spindle quasi stop done
10	IN9	Tool setter signal
11	IN10	Cutterhead launch in place
12	IN11	Cutterhead return in place
13	IN12	Loose tool in place signal
14	IN13	Tight tool in place signal
15	IN14	Cutterhead count signal
16	IN15	Cutterhead origin signal

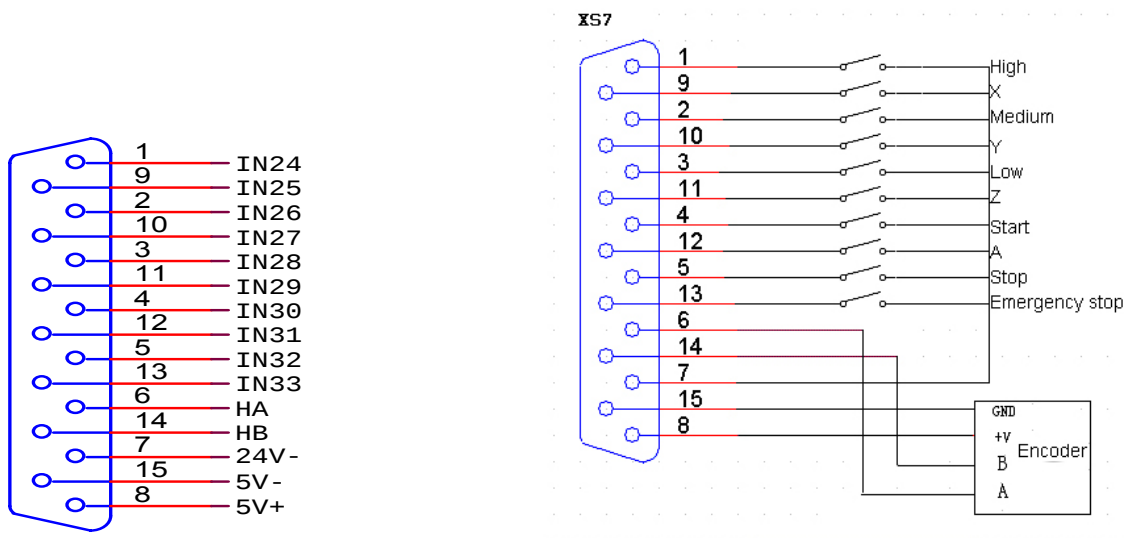
11.2.3. Digital output interface (XS6)



Default output port configuration of engraving machine

wire No.	Definition	Function
1	OUT0	Spindle positive rotation (M03)
2	OUT1	Spindle reverse rotation (M04)
3	OUT2	Spindle alarm release
4	OUT3	Spindle stop
5	OUT4	Cooling (M08, M09)
6	OUT5	Lubricating (M32, M33)
7	OUT6	Alarm indicator
8	OUT7	Running indicator
9	OUT8	System ready indicator (stop)
10	OUT9	Lighting
11	OUT10	Z-axis brake
12	OUT11	Air blow
13	OUT12	Tool magazine positive rotation
14	OUT13	Tool magazine reverse rotation
15	OUT14	Cutterhead launch
16	OUT15	Elastic tool

11.2.4. Handheld box interface (XS7)

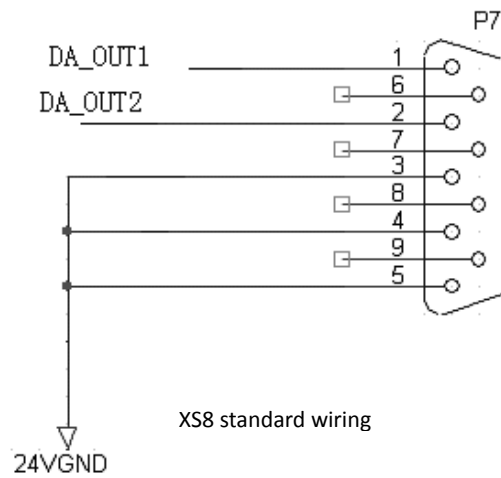


Wire No.	Definition	Function
1	(IN24) gear switch	0.1 gear --- High speed
2	(IN26) gear switch	0.01 gear --- Medium speed
3	(IN28) gear switch	0.001 gear --- Low speed
4	(IN30) button	Cycle start
5	(IN32) button	Emergency stop
7	24V-	Negative pole of internally provided 24V power supply
9	(IN25) axis selection	X axis
10	(IN27) axis selection	Y axis
11	(IN29) axis selection	Z axis
12	(IN31) axis selection	A axis
13	(IN33) button	Emergency stop

6	HA	Hand encoder phase A input signal
14	HB	Hand encoder phase B input signal
15	5V-	Negative pole of internally provided 5V power supply
8	+5V	Positive pole of internally provided 5V power supply
7	24V-	Negative pole of internally provided 24V power supply

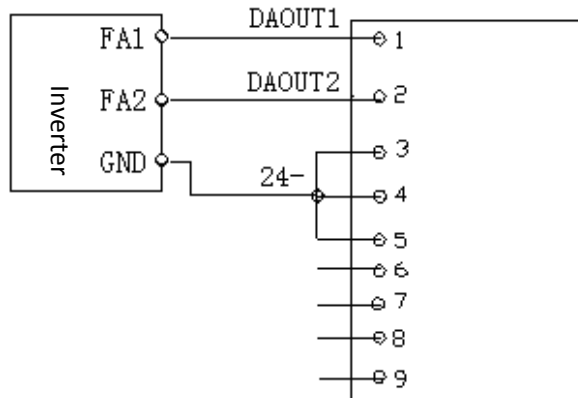
11.2.5. Analog output interface (XS8)

Analog output interface wiring diagram:



The wiring is also suitable for XS8 interface of 4640/4620 controller;

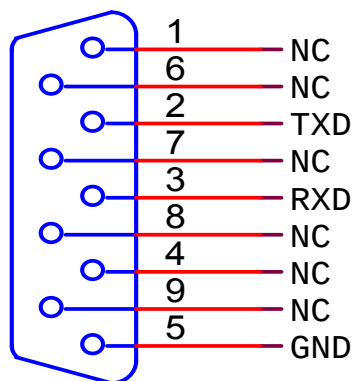
Analog spindle XS8 and inverter wiring

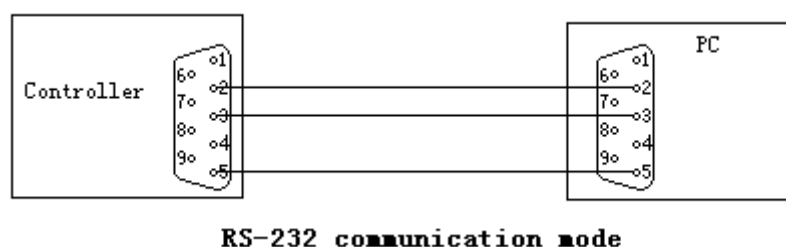


Wire No.	Definition	Function
1	DAOUT1	Analog voltage output (0~10) V
2	DAOUT2	Analog voltage output (0~10) V
3	GND	Internal 24V power grounding
4	GND	Internal 24V power grounding
5	GND	Internal 24V power grounding

11.2.6. RS232 transmission interface (XS9)

Serial communication interface ---9-core signal socket (male)





11.2.7. USB memory connection interface (XS10)

Standard USB memory (e.g. USB disk) interface;

11.2.8. PC USB communication interface (XS11)

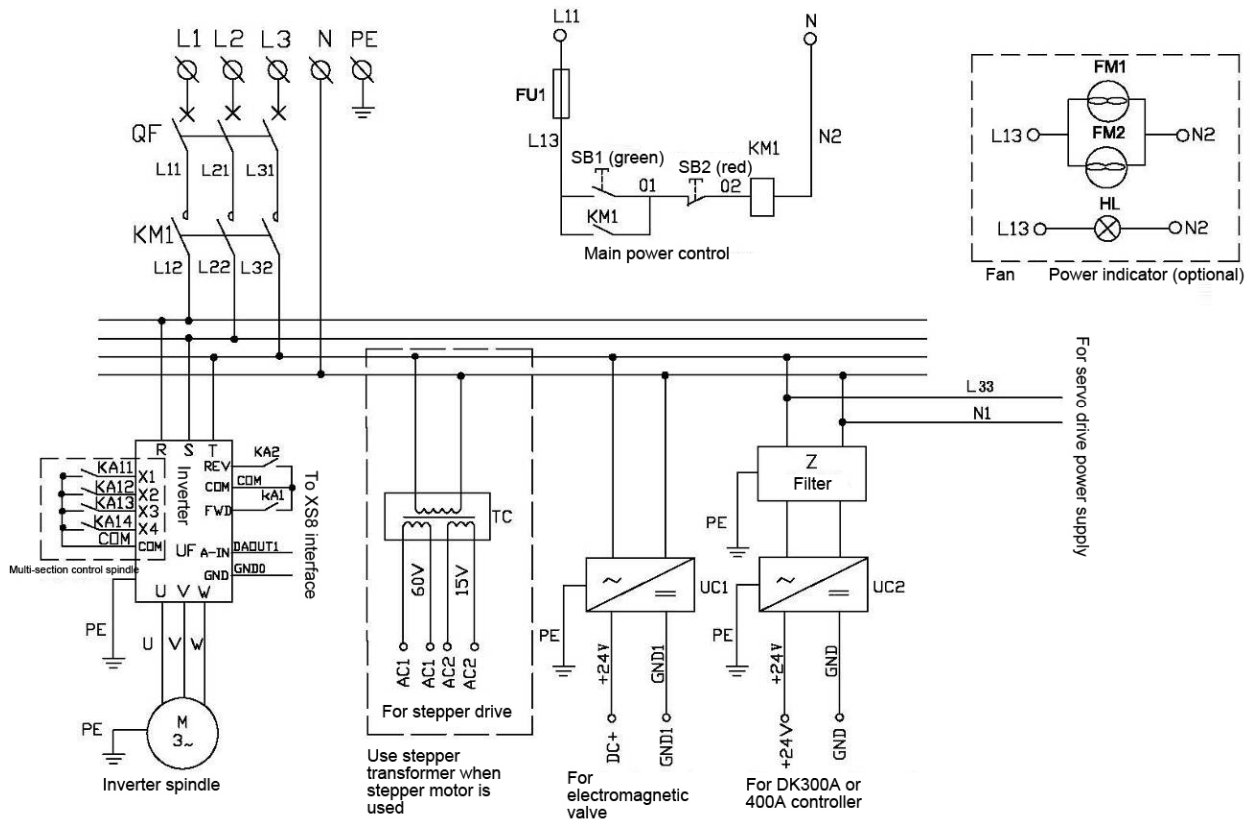
Standard USB communication interface;

11.3. Electrical connection diagram

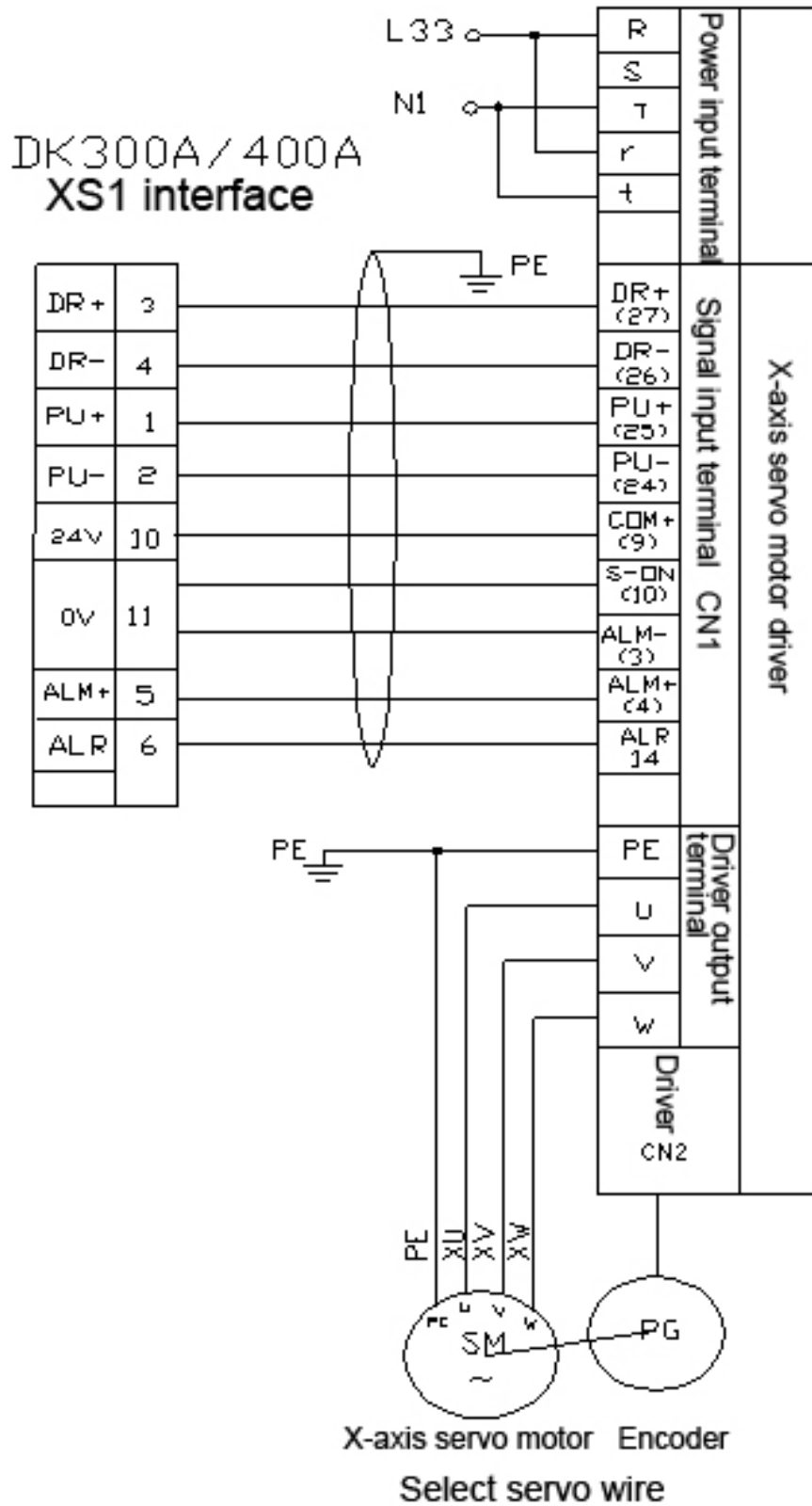
11.3.1. Symbol schematic diagram

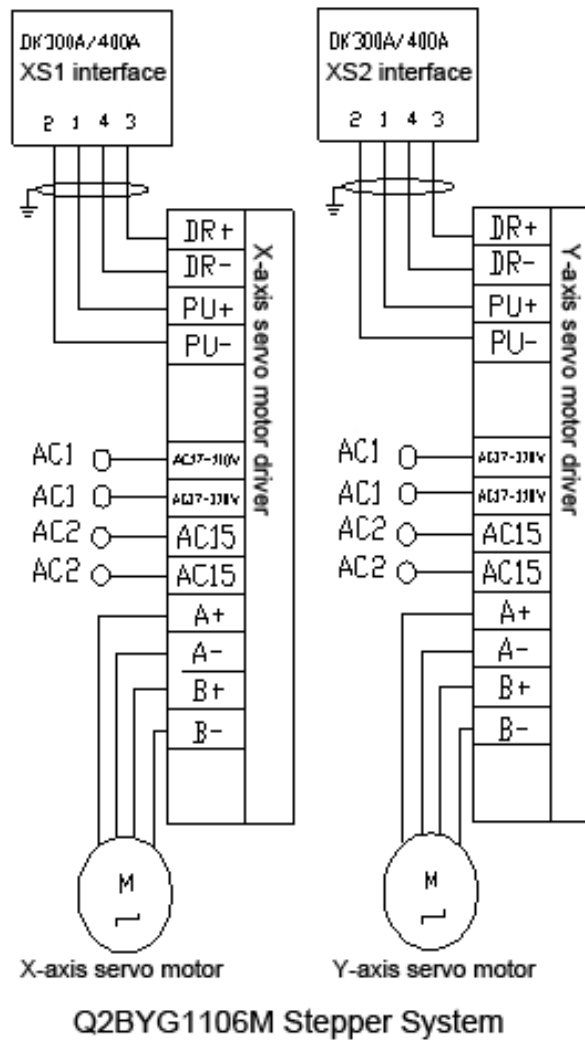
Symbol	Name	Figure	Symbol	Name	Figure
QF	Breaker		SM	Servo motor	
KM	Contactor		M	Step motor	
UF	Inverter		SQ	Approach switch	
M	Motor		SA	Foot switch	
TC	Transformer		YB	Motor brake	
Z	Filter		FR	Thermal relay	
FU	Fuse		UC	Switching power supply	
SB	Button		YV	Electromagnetic valve	
FM	Fan		C	Capacitor	
HL	Indicator		R	Resistor	
QS	Touch switch		QS	Travel switch	
PG	Encoder		KA	Relay	

11.3.2. Power connection diagram



11.3.3. Servo drive connection diagram





11.3.4. Step connection diagram

12. Configuration and system functions

12.1 System configuration

-  CPU: ARM industrial motherboard;
-  Communications: USB interface;
-  Capacity: 64M RAM, 60M Flash ROM;
-  Feedback: AB phase pulse feedback;
-  Control: FPGA motion controller;
-  MPG: Incremental hand encoder;
-  Display: 800x480 dot matrix, 7-inch LCD;
-  Input / output full optocoupler isolation;
-  Touch operation panel;
-  Highly anti-jamming switching power supply;
-  RS232 interface

12.2 System technical parameters

Function	Name		Specifications
Control axis	Control axes		4 axes DK400A 3 axes DK300A
	Axes controlled simultaneously		4 axes linear interpolation DK400A 3 axes linear interpolation DK300A 2 axes arc interpolation
Input command	Minimum setting unit		0.001mm
	Minimum motion unit		0.001mm
	Maximum instruction unit		±9999.999mm
Feeding	Quick feed rate		X-axis, Y-axis, Z-axis, A-axis: 9999 mm/min (max.)
	Feed speed range	Feed per minute	1~9999mm/min
		Feed per revolution	1~500rpm
	Automatic acceleration and deceleration		Yes
	Feed rate override		10~150%
Manual	Manual continuous feed		Yes
	Manual reference position return		All control axes return to reference point (Priority configurable)
	Single step / wheel function		Yes

Function	Name	Specifications
Interpolation	Positioning, linear interpolation, arc interpolation	G00,G01,G02/G03
Running mode	MDI, automatic, manual, single-step, edit	Yes
Debugging function	Test run, single block, handwheel	Yes
Coordinate system and suspension	Pause (sec/ms)	G04 X/P_
	Coordinate system settings	G92
	Automatic coordinate system settings	Yes
Safety measures	Software soft & hard limit check	Yes
	Emergency stop	Yes
Coordinate rotation	Enable rotation	G68
	Disable rotation	G69
Program saving	Program memory capacity, the number of stored program	Total capacity 60MB 100 workspace Unlimited processing file quantity
Program editing	Program editing	Insert, modify, delete, cancel
	Program number, sequence number, address, word retrieval	Yes
	Decimal point programming	Yes
Display	800×480 pixels, 7-inch LCD	

Function	Name	Specifications
	Position screen, program editing Tool offset setting, alarm display Handwheel debugging, diagnostic screen Parameter settings, graphic simulation	Yes
M, S, T function	Auxiliary function	M code
	Spindle function	S0-S15 (gear position control) S15-S99999 (analog)
	Tool function	T code
Offset function	Tool offset memory	30 sets of tool length and radius offset
	Backlash offset	Yes
Other functions	Measurement centering Automatic tool setter	Yes
	Specified radius R / center position	Yes
	Electronic gear ratio	Yes