0: No detect.

It is used for open that display of spindle real speed & some functions related with SP_Speed which must be on condition of transmission ratio is 1:1 between SP_encoder & spindle motor.

10,Pulses Per Revolution of SP_Encoder(4*Encoder Resolution)

It is pulses per revolution of spindle. Pulses= (Resolution of SP-encoder) * 4.

10-1,Allow Error of Revolution of SP_Encoder[>10]

It sets the max allowable error between detecting value & resolutoin_SP_Encoder. Range: >10

10-2,Pulses Per Revolution of Spindle[1/1:0,Other:>99]

It sets the pulses per revoltuion of spindle(4times), When spindle & encoder is 1:1, set to 0, when not 1:1, range is greater than 99.

11,Soft-Limitation is valid [0:Yes, 1: No]

It is bit parameter, set for if soft-limitation is valid of each feeding axis.

Bit	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1
Axis	-	B	A	Z	C(Y)	X	-	-

0: means soft-limitation is valid , 1: means invalid

Example:the soft limit of X-axis is valid, P11= 00000100.

12,X_Reverse Backlash Compensation (um)

It is the value of reverse backlash compensation of X-axis, Radius designation. When direction of X-axis movement is changed ,system will make compensation with the value automatically. Unit: um

13,Z_Reverse Backlash Compensation (um)

It is the value of reverse backlash compensation of Z-axis.When direction of Z-axis movement is reversed ,system will make compensation with the value automatically. Unit: um

14,X_Direction [1:normal, 0: Reverse]

It is for set the direction of X-axis. 1: Direction of X-axis is same to direction of code; 0: Direction of X-axis is opposite to direction of code.

15,Z_Direction [1:normal, 0: Reverse]

It is for set the direction of Z-axis. 1: Direction of Z-axis is same to direction of code; 0: Direction of Z-axis is opposite to direction of code.

16,Using Electron Gear Ratio for Feeding Axes [0:Yes, 1:No]

It is for whether using the electron gear ratio for feeding axis. 0: yes,using electron gear, 1: No, don't using electron gear.

17,Numerator of X_Electron Gear (1-999999)

It is Numerator of X-axis's electron gear ratio.(X_CMR) Range: 1-999999.

18,Denominator of X_Electron Gear (1-999999)

It is Denominator of X-axis's electron gear ratio.(X_CMD) Range: 1-999999.

19,Numerator of Z_Electron Gear (1-999999)

It is Nuamerator of Z-axis's electron gear ratio. (Z_CMR) Range: 1-999999.

20,Denominator of Z_Electron Gear (1-999999)

It is Denominator of Z-axis's electron gear ratio.(Z_CMD) Range: 1-999999.

Algorithm of P17-P20 & P105/P106 & P204/P205 parameters
Effective Range: 1-999999
Unit:non
User:Upon operating administrators
Initialization:1
Effective time:Immediately
Explain:

When lead screws with different screw pitches are configured with motors of various step angles,or with servo motors of different pulse number per round,or connections are realized through different gears,the programmed values can remain consistent with the actual moved distance by setting the parameter of the electronic gear ration of the system.

$$\text{Electron Gear Ratio} = \frac{\text{Numerator}}{\text{Denominator}} = \frac{\text{CMR}}{\text{CMD}} = \frac{P}{L*1000}$$

CMR:Numerator of gear ratio
CMD:Denominator of gear ratio
P: pulse number per motor round
L: Moved distance per motor round(mm)
The value of CMD/CMR is the pulse equivalent,which tells the moved distance per pulse ,with its unit as 0.001mm.
Example1: The motor rotates one circle very 5000 pulses,after which the machine tool moves 5mm,then:

    CMR/CMD = 5000 / (5 * 1000)　　= 1/ 1

That is to say,we can set the values as :CMR=1,CMD=1.

Here ,the pulse equivalent is 0.001mm.
Example2: The motor rotates one circle very 5000 pulses,after which the machine tool moves 10mm.

    CMR/CMD = 5000 / (10 * 1000) = 1 / 2

That is to say,we can set the values as :CMR=1,CMD=2.

Here ,the pulse equivalent is 0.002mm.

21,Type of Limit Switch in Positive Direction[0:NO type, 1:NC type]
It is set type of limit switch in positive direction, also type of switch that is connected to +L,PIN16_CN3 plug. 0:NO Type, 1: NC Type.

22,Type of Limit Switch in Negative Direction[0:NO type, 1:NC type]
It is set type of limit switch in negative direction, also type of switch that is connected to -L,PIN15_CN3 plug. 0:NO Type, 1: NC Type.

23,Type of Home [D3X;D4(C)Y;D5Z;D6A;D7B; 0:Switch; 1:float Zero]
It is set type of home. bit parameter. Each axis set alone.

Bit	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1
Axis	B	A	Z	C(Y)	X	-	-	-

0: Switch/Sensor for home, 1:Float Zero point for home.
Example:Only Home of X-axis is float zero point, P23=00001001.

24,X_Machine Coordinate of float zero point
It is set the machine coordinate value of X-axis based on float zero point. The value is distance between current position of machine tool & float zero point.

25,Z_Machine Coordinate of float zero point

It is set the machine coordinate value of Z-axis based on float zero point. The value is distance between current position of machine tool & float zero point.

26,Grade of Homing[1:No need, 0:Prompt, 8:Compulsion, 9:Super compulsion]

It set the grade of homing for feeding axis.there is 4 grades as follow:

1 : No need. When system boots every time,no prompt and no limitation;

0 : Prompt. After system boot every time,there is a prompted box for homing , and then there aren't any limitation about homing;

8 : Compulsion. When system boots every time, there will a prompted box for homing. And then, if system don't homing successfully, it will hint "feed axis don't go home" before running program ,and don't run processing program;

9 : Super complusion. When system boots every time, there will a prompted box for homing. And then,if system don't homing successfully,it will hints "feed axis don't go home" at each operations ,and feeding axes don't move.

27,Mode of Homing

It set mode of homing. There are 4 kinds of mode about homing.

0 : Homing after hit homing switch, move in reverse direction until homing switch is off, then detect Z0 signal of Encoder of servo motor.

1 : Homing after hit homing switch, move in reverse direction until homing switch is off.

2 : Homing after hit homing switch, move forward until homing switch is off, then detect Z0 signal of encoder of servo motor.

Other: Homing after hit homing switch,move forward until homing switch is off.

28,Direction of Homing [D2:X,D3:C(Y),D4:Z,D5:A,D6:B]

It sets the direction & sequence of homing for each axis. Bit parameter.

Bit	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Axis	-	-	-	-	-	-	-	-	-	B	A	Z	C(Y)	X	-	-

0:Homing in positive direction, 1:Homing in negative direction, D8: set priority of X&Z-axis go home.1 means Z-axis first,0 means X-axis first.

29,Type of Switch for Homing [D0X;D1C(Y);D2Z;D3A;D4B; 1:NC ; 0:NO]

It set the type of switch for homing. Bit parameter.

Bit	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1
Axis	-	-	-	B	A	Z	C(Y)	X

1: NC type; 0: NO type.D7=1:Manual/Auto shift automatically ;
Example:If X&Z axis are NC switch,the bit parameter is 000000101.

30,Range of Detect Z0 in X axis (unit:100um)

It is range that system can detect Z0 signal of encoder in X direction.
Attention:the value must be less than the length of one rev,otherwise homing failure.

31,Range of Detect Z0 in Z axis (unit:100um)

It is range that system can detect Z0 signal of encoder in Z direction.
Attention:the value must be less than the length of one rev,otherwise homing failure.

32,Offset after homing in X axis (unit:10um,-9999~+9999)

It is offset that X-axis after homing. Move with G00 speed. Unit: 0.01mm.

33,Offset after homing in Z axis (unit:10um,-9999~+9999)

It is offset that Z-axis after homing. Move with G00 speed. Unit: 0.01mm

50,Spindle is rotating when shift gear [1:Yes, 0:No]
   It set if spindle is rotating when spindle shift gears.1:Yes, SP is rotating, 0: No.

51,Rotating Speed of Spindle when shift gear(1/100rpm)
   It is rotating speed of spindle when spindle shift gear & P51=1.

52,Rotating Direction of Spindle when shift gear [0:CW,1:CCW]
   It is rotation direction of spindle when spindle shift gear. 0: CW, output M03; 1:CCW, output M04.

53,Braking Time of Spindle when shift gear (10ms)
   It is braking time of spindle when spindle shift gear. Unit: 10ms.

54,Delay time between reset M03/M04 & set M05 (10ms)
   It is delay time before output M05 ,and after reset M03/M04. Unit:10ms.

55,Spindle stop time(unit:10ms)
   It is the delay time between cancel M03/M04 and boot M05.unit:10ms.

68,Delay time when feeding axes shift direction (ms)
   It is the delay time when feeding axes change direction, unit: ms.

80,Mode of X&Z axis
   It is bit parameter. Each bit have its related function. 1: Valid, 0: Invalid.
   D2:Z axis based on Workpiece coordinate system;D3:X axis based on Workpiece coordinate system; D4:Z axis based on Machine coordinate system; D5:X axis based on Machine coordinate system. D6:Z axis is rotation axis; D7:X axis is rotation axis.

Bit	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1
Func	XR	ZR	XM	ZM	XW	ZW	-	-

100,System Inner Parameter
   Inner parameter of system, cannot be altered.

101,Name of 3rd Axis [0:Y, 1:C]
   It is set for name of 3rd axis, 0: set to Y , display & programming with "Y", normally when 3rd axis is linear axis; 1: set to C, display & programming with "C", normally when 3rd axis is rotating axis.

102,Mode of Y(C) Axis [0:Rotating Axis, 1: Linear Axis]
   It is set for the mode of Y(C)-axis, 0: Rotating axis , 1: Linear axis.

104,C(Y)_Direction   [1:normal, 0: Reverse]
   It is for set the direction of C(Y)-axis. 1: Direction of C(Y)-axis is same to direction of code; 0: Direction of C(Y)-axis is opposite to direction of code.

105,Numerator of C(Y)_Eletronic Gear
   It is Numerator of C(Y)-axis's electron gear ratio. (C_CMR) Range: 1-999999.

106,Denominator of C(Y)_Eletronic Gear
   It is Denominator of C(Y)-axis's electron gear ratio.(C_CMD) Range: 1-999999.

107,C(Y)_Reverse Backlash Compensation (um)

It is the value of reverse backlash compensation of C(Y)-axis.When direction of X-axis movement is changed ,system will make compensation with the value automatically. Unit: um

108,G00 Speed of C(Y) Axis (mm/min)

It is rapid speed(also speed of G00) of C(Y) axis,Max is 240000(unit:mm/min)

Attention: the value depends on machine configuration,set wrong is very easy to trouble machine tool & accident.

109,Max Speed of C(Y)_G1G2G3

It is for the Max running speed of C(Y)-axis when G1/G2/G3 interpolation.

110,C(Y)_Acceleration/Deceleration Constant

It is time constant of X-axis acc/dec-eleration,the bigger it is ,the faster the ace/dec-eleration is.

Attention:This value depends on the machine structure,the heavier the load is ,the smaller the value is.With stepper system,the value should less than 15000.

111,C(Y)_Max Speed with Handwheel (mm/min)

It is for limit max speed of X-axis when use handwheel in manual.

Attention:it is valid when >100,otherwise invalid.And suggest don't over 4000.

112,Speed of C-axis return to Zero point of Encoder(°/min)

It is the speed of C-axis return to Z0 of Encoder. Unit:°/min. the range is less than the G00 speed of C-axis.

113,Y_Homing Speed (mm/min)

It is homing speed of Y-axis .Unit:mm/min. the range is less than Y_G00 speed.

114,Y_Speed for Detect Z0 signal (mm/min)

It is speed for check Z0 pulse singal after Y-axis reach at homing switch. Unit:mm/min. the range is 20-500.

Note:For ensure accuracy.the smaller it is ,the higher the accuracy is.when set well,don't change it forever.

115,Range of detect Z0 in C(Y) axis (100um)

It is range that system can detect Z0 signal of encoder in C(Y) direction.

Attention:the value must be less than the length of one rev,otherwise homing failure.

116,Offset after homing in Y axis (Unit:10um)

It is offset that Y-axis after homing. Move with G00 speed. Unit: 0.01mm

117,Max Travel in C(Y)-Negative Direction

It is max travel in negative direction of C(Y) axis when soft-limitation, which is based on machine coordinate system.

118,Max Travel in C(Y)-Positve Direction

It is max travel in positive direction of C(Y) axis when soft-limitation, which is based on machine coordinate system.

119,C(Y)_Machine Coordinate of float zero point

It is set the machine coordinate value of C(Y)-axis based on float zero point. The value is distance between current position of machine tool & float zero point.

200,System Inner Parameter

Inner parameter of system, cannot be altered.

201,Mode of A Axis [0:Rotating Axis, 1: Linear Axis]

It is set for the mode of A-axis, 0: Rotating axis , 1: Linear axis.

202,Base when A axis is rotating axis

It is set the base of A-axis when it is rotating axis. 0:Null, 1:Based on Absolute Coordinate, 2: Based on Machine Coordinate, 3: Both.

203,A_Direction [1:normal, 0: Reverse]

It is for set the direction of A-axis. 1: Direction of A-axis is same to direction of code; 0: Direction of A-axis is opposite to direction of code.

204,Numerator of A_Eletronic Gear

It is Numerator of A-axis's electron gear ratio. (A_CMR) Range: 1-999999.

205,Denominator of A_Eletronic Gear

It is Denominator of A-axis's electron gear ratio.(A_CMD) Range: 1-999999.

206,A_Reverse Backlash Compensation (um)

It is the value of reverse backlash compensation of A-axis.When direction of A-axis movement is changed ,system will make compensation with the value automatically. Unit: um

207,G00 Speed of A Axis

It is rapid speed(also speed of G00) of A axis,Max is 240000(unit:mm/min)

Attention: the value depends on machine configuration,set wrong is very easy to trouble machine tool & accident.

208,Max Speed of A_G1G2G3

It is for the Max running speed of A-axis when G1/G2/G3 interpolation.

209,A_Acceleration/Deceleration Constant

It is time constant of A-axis acce/dece-leration,the bigger it is ,the faster the ace/dec-eleration is.

Attention:This value depends on the machine structure,the heavier the load is ,the smaller the value is.With stepper system,the value should less than 15000.

210,A_Max Speed with Handwheel (mm/min)

It is for limit max speed of A-axis when use handwheel in manual.

Attention:it is valid when >100,otherwise invalid.And suggest don't over 4000.

211,A_Homing Speed (mm/min)

It is homing speed of A-axis .Unit:mm/min. the range is less than A_G00 speed.

212,A_Speed for Detect Z0 signal (mm/min)

It is speed for check Z0 pulse singal after A-axis reach at homing switch.

213,Range of detect Z0 in A axis

It is range that system can detect Z0 signal of encoder in A direction.

Attention:the value must be less than the length of one rev,otherwise homing failure.

214,Offset after homing in A axis

It is offset that A-axis after homing. Move with G00 speed. Unit: 0.01mm

215,Max Travel in A-Negative Direction

It is max travel in negative direction of A axis when soft-limitation, which is based on machine coordinate system.

216,Max Travel in A-Positve Direction

It is max travel in positive direction of A axis when soft-limitation, which is based on machine coordinate system.

217,A_Machine Coordinate of float zero point

It is set the machine coordinate value of A-axis based on float zero point. The value is distance between current position of machine tool & float zero point.

301,Mode of B Axis [0:Rotating Axis, 1: Linear Axis]

It is set for the mode of B-axis, 0: Rotating axis , 1: Linear axis.

302,Base when B axis is rotating axis

It is set the base of B-axis when it is rotating axis. 0:Null, 1:Based on Absolute Coordinate, 2: Based on Machine Coordinate, 3: Both.

303,Name of 5th Axis [0:B, 1:C]

It is set for name of 5th axis, 0: set to B , display & programming with "B", normally when 5th axis is linear axis; 1: set to C, display & programming with "C", normally when 5th axis is rotating axis.

304,B_Direction [1:normal, 0: Reverse]

It is for set the direction of B-axis. 1: Direction of B-axis is same to direction of code; 0: Direction of B-axis is opposite to direction of code.

305,Numerator of B_Eletronic Gear

It is Numerator of B-axis's electron gear ratio. (B_CMR) Range: 1-999999.

306,Denominator of A_Eletronic Gear

It is Denominator of A-axis's electron gear ratio.(B_CMD) Range: 1-999999.

307,B_Reverse Backlash Compensation (um)

It is the value of reverse backlash compensation of B-axis.When direction of B-axis movement is changed ,system will make compensation with the value automatically. Unit: um

308,G00 Speed of B Axis

It is rapid speed(also speed of G00) of B axis,Max is 240000(unit:mm/min)

Attention: the value depends on machine configuration,set wrong is very easy to trouble machine tool & accident.

309,Max Speed of B_G1G2G3

It is for the Max running speed of B-axis when G1/G2/G3 interpolation.

310,B_Acceleration/Deceleration Constant

It is time constant of B-axis acce/dece-leration,the bigger it is ,the faster the ace/dec-eleration is.

Attention:This value depends on the machine structure,the heavier the load is ,the smaller the value is.With stepper system,the value should less than 15000.

311,B_Max Speed with Handwheel (mm/min)
It is for limit max speed of B-axis when use handwheel in manual.
Attention:it is valid when >100,otherwise invalid.And suggest don't over 4000.

312,B_Homing Speed (mm/min)
It is homing speed of B-axis .Unit:mm/min. the range is less than B_G00 speed.

313,B_Speed for Detect Z0 signal (mm/min)
It is speed for check Z0 pulse singal after B-axis reach at homing switch.

314,Range of detect Z0 in B axis
It is range that system can detect Z0 signal of encoder in B direction.
Attention:the value must be less than the length of one rev,otherwise homing failure.
315,Offset after homing in B axis
It is offset that B-axis after homing. Move with G00 speed. Unit: 0.01mm

316,Max Travel in B-Negative Direction
It is max travel in negative direction of B axis when soft-limitation, which is based on machine coordinate system.

317,Max Travel in B-Positve Direction
It is max travel in positive direction of B axis when soft-limitation, which is based on machine coordinate system.

318,B_Machine Coordinate of float zero point
It is set the machine coordinate value of B-axis based on float zero point. The value is distance between current position of machine tool & float zero point.

300,System Inner Parameter
Inner parameter of system, cannot be altered.

400,Detect Position Feedback of Spindle[1:Yes, 0:No]
It sets that if system detect position feedback signal of spindle motor from SP_Encoder. 1: Yes, detect, 0: No detect.

404,SP_Direction when position control mode
It is the direction of spindle motor,o means reverse,1 mean normal.

405,Using Eletronic Gear Ratio for Spindle [0:Yes, 1:No]
It is for whether the spindle use electron gear.

406,Numerator of SP_Eletronic Gear Ratio in Low Gear (1-999999)
It is the numerator of SP-axis's electron low gear in low gear.

407,Denominator of SP_Eletronic Gear Ratio in Low Gear (1-999999)
It is the denominator of SP-axis's electron low gear in low gear.

408,Numerator of SP_Eletronic Gear Ratio in High Gear (1-999999)
It is the numerator of SP-axis's electron low gear in high gear.

409,Denominator of SP_Eletronic Gear Ratio in High Gear (1-999999)
    It is the denominator of SP-axis's electron low gear in high gear.

410,Interpolation Axis when spindle do tapping[91 X,92 Y/C,93 Z,94 A,95 B,96 C]
    It sets the interpolation axis that be use for spindle when interpolation tapping. 91: X-axis, 92: Y axis/C-axis ; 93: Z-axis; 94:A-axis; 95:B-axis; 96: C-axis, also different name of B-axis, which is set by P303 in Other parameter.

411,Control Mode of Tapping [0:Following, 4: Interpolation]
    It is control mode of tapping, when set to 0, tapping following spindle encoder; when set to 4, spindle tapping interpolate with feeding axis , which set by P410.

412,Teeth of SP_Motor (<P413)
    It is tooth number of spindle.it <=P413.

413,Teeth of SP_Encoder (>P412)
     It is tooth number of SP-encoder,it >=P412.
Attention :the tooth number of spindle must be not more than the tooth number of SP-encoder,when less,it need to install our company's adapter plate.

414,Follow-Up of A Axis[7:X, 8:Y, 9:Z]
    It is set the function of follow up of A-axis. Set to 7: A-axis follow up with X-axis; Set to 8: A-axis follow up with Y-axis ; Set to 9: A-axis follow up with Z-axis. A-axis follow up on condition of both Manual & Auto.

Special Cautions:
    1.Only when CNC controller is configured with related feeding axis, and there are related parameters sets for related feeding axis, such as C axis & A-axis.
    2.About bit parameters, if some bits are don't specified functions for feeding axis, please keep same to ex-factory set, which should be important for inner system, otherwise it will affect normal operations of CNC system.

2.4 Tool parameter

P	Tool Parameter	Ex-Value
1	Activate ATC Function(1:Yes, 0:No)	1
2	Tool Number of Electric Turret (+1)	5
3	Type of Lathe Machine	0
4	Max Time of Turret Positive Rotation(s)	8.000
5	Delay Time before detect after rotating(ms)	100.000
6	Delay Time after turret stop positive rotation(ms)	100.000
7	Time of Turret Negative Rotation for lock(ms)	1200.000
9	Detect Position of Lock (1: Yes, 0:No)	0
10	Mode of Setup Radius C Compensation	0
11	Mode of Cancel Radius C Compensation	0
20	Mode of Turret(1:Electric Turret; 0:Special Turret)	1
32	Filtering for Position Singal or WAT Signal	1283

Explanation about Tool Parameter:

1,Active ATC function [1:Yes, 0: No]

It is for whether activate function of tool changer automitically. 0: No, lathe machine is without turret for tool magazine 1: yes, lathe machine is with turret for tool change, after tool is on position,no detect position signal of tool. 8: yes, after tool is on position, system will detect position signal of tool again.

Attention: 1.when the machine tool is only with linear turret ,the parameter is set to 0;

2.Set sum of tools,Press "F7"key and input sum in Redeem(tool compensation) screen.

2,Tool Number of Electric Turret (+1)

It is total tool number of electric turret.The value of this parameter needs to add 1 based on actual tool number. Example:When with 4 tools on turret, set P2=5.

When lathe machine is configured with 4 tools on electric turret and 4-linear tools. On "Redeem" screen, press "C" key to set total tools, which is 8. and the parameter is 5, so T1-T4 means tools of electric turret,T5-T8 means tools of linear turret.

3,Type of Lathe Machine

It is type of lathe machine, also structure of machine tool.

0:turret in front of horizontal lathe; 1:turret behind of horizontal lathe;

8:turret in front of vertical lathe; 9:turret behind of vertical lathe.

Note: There are related introductions about type of lathe on chapter2.1.1 & chapter 2.5.1, this parameter also setup different machine coordiante system for machine tool.

4,Max Time of Turret Positive Rotation(s)

It is max time of turret rotates in positive directin to find position signal of tool. When system didn't find position signal of tool within the setting time, it will stop changing tool & rotation and alarm. Unit: second.

5,Delay Time before detect after rotating(ms)

It is delay time to detect position signal of tool after turret rotates in positive direction. Unit: millisecond.

6,Delay Time after turret stop positive rotation(ms)

It is delay time after turret stop rotating in positive direction, also time after reset (+T_CN4) signal , and before output (-T_CN4) signal. Unit: ms.

7,Time of Turret Negative Rotation for lock(ms)

It is the time of turret rotates in negative direction for locking turret , also the time of output (-T_CN4) signal.

Attention:The value is realted to size of turret on machine tool. Motor on turret would be over-heat when the value is too big.

9,Detect Position of Lock (1: Yes, 0:No)

It sets whether system detect position signal of lock. 1:Yes, detect, 0:No detct. Input point of detection is TOK, PIN9 of CN4 Plug.

10,Mode of Setup Radius C Compensation (0:A type, 1:B type)
11,Mode of Cancel Radius C Compensation (0:A type,1:B type)

They are mode of setup/cancel radius C compensation, details at chapter3.26.

20,Mode of Turret(1:Electric Turret; 0:Special Turret)

It sets mode of turret. When with special turret, it needs to design "ProgramTool" & PLC for special turret.

32,Filtering for Position Singal or WAT Signal

It is set filtering time for position signal of electric turret or WAT signal on special turret.

Time	Position Signal	WAT signal
2ms	+256	+2048
4ms	+512	+4096
8ms	+1024	+8192

2.5 Other Parameter

P	Other Parameter	Ex-Factory
1	Type of Handwheel(0:Panel, 1:Handheld)	0
2	Type of Chuck	0
3	Using Interface Switch on Panel(0: No, 1:Yes)	1
4	Lubricate Automatically (0:Yes, 1:No)	0
5	Time of Lubrication (10ms)	300
6	Interval of Lubricate Automatically(s)	1800
7	Detection for Door Switch(0:No, 1:Yes)	0
8	Type of Door Switch(0:NO type, 1:NC type)	0
9	Special Bit Parameter	1000010001000101
10	Counting Workpieces Automatically(0:No, 1:Yes)	1
11	Increment of shift block	1
12	System Inner Parameter	9
13	Interlock between Rotation_SP & Chuck(0:No, 1:Yes)	1
13-1	Interlock between Rotation_SP & Tailstock(0:No, 1:Yes)	1
14	Coolant key is valid on Auto(0:No, 1:Yes)	1
15	Detect Position of Chuck(M10/M11)(0:No, 1:Yes)	0
16	Detect Position of Tailstock(M79/M78)(0:No, 1:Yes)	0
17	Type of Driver Alarm(ALM)(0:NO type, 1:NC type)	0
18	Type of Spindle Alarm(ALM1)(0:NO type, 1:NC type)	0
19	Type of Machine Alarm(ALM2)(0:NO type, 1:NC type)	0
20	Control Mode of Chuck(0:Single, 1:Double)	0
21	Control Mode of Tailstock(0:Single, 1:Double)	0
22	External Switch for Chuck(0:No, 1:Yes)	0
23	External Switch for Tailstock(0:No, 1:Yes)	0
24	Time of Chuck(s)	0.00
24-1	M10 Long Signal(0:No, 1:Yes)	0
24-2	M71 Long Signal(0:No, 1:Yes)	0
24-3	Chuck M10 or M11 boot [0:M10, 1:M11]	0
25	Time of Tailstock(s)	0.00
25-1	M79 Long Signal(0:No, 1:Yes)	0
25-2	M73 Long Signal(0:No, 1:Yes)	0
26	Type of Emergency Stop1(0:NO type, 1:NC type)	0
27	Type of Emergency Stop2(0:NO type, 1:NC type)	0
28	Run/Pause Output(0:No, 1:Yes)	0
29	Alarm Output(0:No, 1:Yes)	0
30	Language(1:Chinese, 0:English)	0
31	Use Inner PMC(0:No, 1:Yes)	1
32	Use High-Speed Inner PMC(0:No, 1:Yes)	1
33	HY as Running Key(0:No, 1:Yes)	0
34	HA as Halt Key(0:No, 1:Yes)	0
35	Soft-Limit is Valid when no homing(0:No, 1:Yes)	1
36	Time(Year-Month-Day-Hour-Minute)	
37	Rate of RS232	6
38	Latched for Rapid Key(8:Yes)	1
39	System Inner Parameter	1

40	System Inner Parameter	-88
41	Backup Current Parameters	
42	Recovery Backup Parameters	
120	Direction of Manual Feeding Key	1
200	X_Feedback Allow Error During Moving (Pulse) [>1]	1
201	Y_Feedback Allow Error During Moving (Pulse) [>1]	1
202	Z_Feedback Allow Error During Moving (Pulse) [>1]	1
203	A_Feedback Allow Error During Moving (Pulse) [>1]	1
204	B_Feedback Allow Error During Moving (Pulse) [>1]	1
205	X_Feedback Allow Error When Stopping (Pulse) [>1]	1
206	Y_Feedback Allow Error When Stopping (Pulse) [>1]	1
207	Z_Feedback Allow Error When Stopping (Pulse) [>1]	1
208	A_Feedback Allow Error When Stopping (Pulse) [>1]	1
209	B_Feedback Allow Error When Stopping (Pulse) [>1]	1
210	Numerator of X_Electron Gear for Position Feedback	1
211	Numerator of Y_Electron Gear for Position Feedback	1
212	Numerator of Z_Electron Gear for Position Feedback	1
213	Numerator of A_Electron Gear for Position Feedback	1
214	Numerator of B_Electron Gear for Position Feedback	1
215	Denominator of X_Electron Gear for Position Feedback	1
216	Denominator of Y_Electron Gear for Position Feedback	1
217	Denominator of Z_Electron Gear for Position Feedback	1
218	Denominator of A_Electron Gear for Position Feedback	1
219	Denominator of B_Electron Gear for Position Feedback	1
500	Series Number of Ex-Factory	0.00
501	Shift Color Display of Screen(1:No, 8:Yes)	1
601	Define Parameters for Step	
602	Define Parameters for Servo	Servo
900	Display User-define Dialog Box[1:No, 4:Yes]	4
901	Homing Sequence of Axis(5bits)	1
910	High-Speed Input of M18/M22/M24/M28 for G31/G311	0
911	Using M18_Teachin, M28_Record(0:No, 1:Yes)	0
912	"Reset"key reset Outputs(0:No, 1:Yes)	1

Note:P12&P39&P40 are System Inner Parameter, cannot be altered.

Explanation about Axis Parameter:

1,Type of Handwheel(0:Panel, 1:Handheld)

     It sets the type of handwheel,0:Handwheel in operatinal panel, 1:Handwheel in handheld box.

   Note: when the parameter is 1 (P1=1), CN11 is connected to handheld box; & can't use rate of spindle&feeding axis,only off/X/Y/Z/A &*1/*10/*100(also P1&P2=0 in Axis parameter).

2,Type of Chuck

     It set type of chuck, 0: Inside Chuck(M10: chuck clamp to center); 1:Outside Chuck(M10: chuck clamp to external).

3,Using Interface Switch on Panel(0: No, 1:Yes,)

It sets whether system use interface switch on operational panel. 0:No, don't use interface switch; 1:Yes,use interface switch.

4,Lubricate Automatically (0:Yes, 1:No)

It sets whether system use lubricate automatically. 0:Yes, lubricate automatically is valid, 1:No use lubricate automatically.

Attention:Lubricate automatically according to time of running program.

5,Time of Lubrication (10ms)

It sets the time of lubricate automatically , also time of outputing M32, PIN9_CN3 Plug. Unit:0.01s.

6,Interval of Lubricate Automatically(s)

It is the interval that lubricate every time,also the interval that twice M32 is valid.

7,Detection for Door Switch(0:No, 1:Yes)

It sets whether system detect the signal of protective-door. 0:No detect, 1:Yes.

Attention:1. Input point for door switch: M12, PIN11_CN10 plug.

2. After set P7=1,system can work in Manual,and stop processing in Auto.

3. Pin for detect Chuck_clamp&Door-switch are M12, only one usage is valid.

8,Type of Door Switch(0:NO type, 1:NC type)

It is type of Door-switch. 0:NO type(normal open),1:NC type(normal close).

9,Special Bit Parameter

It is bit parameter,each one bit have different functions,detailes as following:

Bit	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1

D0: Null; default value is 1,which cannot be altered.

D1: 1:Clear Part Number after reboot system; 0:Keep Part number.

D2: 1:Indent automatically between characters when edit; 0:No blank;

D3: Null; default value is 0,which cannot be altered.

D4: Null; default value is 0,which cannot be altered.

D5: 1:Don't stop Rotation_SP & Coolant when pressing "Reset" key;

D6: 1:Each axis run with itself speed when G00; 0: linkage movement;

D7:   1:Don't call related tool compensation when tool change manually; 0: Call related tool compensation automatically; default is 0.

D8:   1:Save status of Chuck(M10/M11) when power off;Recovery original status when booting system; 0: System ouput M10 autmtically when booting.

D9:   Select Mode of tool set & input mode of Redeem;

D10: 1:Auto Sequence for block when programming;

D11: 1:Analog of 1st spindle outputs to both +10V_CN3&CN10;

D12: 1:Shield function of "Skip" ,also "/" in the fornt of blocks is invalid;

D13: 1:Shield function of "Return" key on operational panel;

D14:   1:Shield function of "Start" key on operatinal panel;

D15:   1:Value of Redeem displays with Increment type; 0: Value of Redeem displays with absolute type;

Attention:some bits of this bit parameter cannot be altered , otherwise it maybe system will work abnormal.

10,Counting Workpieces Automatically(0:No, 1:Yes)

It set whether system counting number of workpiece automatically, 0:No counting workpieces automaticaly; 1:Yes,counting automatically.

11,Increment of shift block

It sets the increment of block when change lines.

12,System Inner Parameter

❖   It is system inner parameter,which cannot be altered.

13,Interlock between Rotation_SP & Chuck(0:No, 1:Yes)

It sets interlock between rotation of spindle and Chuck(M10). 0:No interlock, rotation of spindle isn't related to Chuck; 1:Yes,only when chuck is clamping,and then spindle can rotate; when spindle is rotating, Chuck cannot unclamping.

13-1,Interlock between Rotation_SP & Tailstock (0:No, 1:Yes)

It sets interlock between rotation of spindle and tailstock(M79). 0:No interlock, rotation of spindle isn't related to Tailstock; 1:Yes,only when tailstock forward, and then spindle can rotate;

14,Coolant key is valid on Auto(0:No, 1:Yes)

It sets if Press "Coolant"key is valid on Auto. 0:No,"Coolant" key doesn't work on Auto; 1:Yes, "Coolant" key also works in condition of Auto.

15,Detect Position of Chuck(M10/M11)(0:No, 1:Yes)

It sets if detect position of chuck. 0:No detect; 1:Yes,detect.

If P15=1, M12,PIN11_CN10 Plug, position input for Chuck(Clmamp/M10); M14 , PIN24_CN10 plug, position input for Chuck(Loose/M11)

Attention: It is same pin(M12) of check of Chuck-clamp&Door-switch, only one usage is valid.If check chuck clamp if is in position,also cannot be used as check of Door-switch.

It is same pin(M14) of check of Chuck-loose&Tailstcok-switch,only one usage is valid. If check chuck-loose if is in position,also cannot be used as Tailstock control switch.

16,Detect Position of Tailstock(M79/M78)(0:No, 1:Yes)

It sets if detect position of tailstock. 0:No detect; 1:Yes, detect;

If P16=1, M18,PIN10_CN10 Plug, position input for Tailstock(Forward/M79; M28,PIN23_CN10 Plug, position input for Tailstock(Backward/M78).

17,Type of Driver Alarm(ALM)(0:NO type, 1:NC type)

It sets the type of driver alarm. ALM,PIN12_CN5 plug, 0:NO type; 1:NC type.

18,Type of Spindle Alarm(ALM1)(0:NO type, 1:NC type)
    It sets the type of spindle alarm. ALM1,PIN5_CN3 plug,0:NO type; 1:NC type.

19,Type of Machine Alarm(ALM2)(0:NO type, 1:NC type)
    It sets the type of machine_tool alarm. Input point is ALM2, PIN2_CN10 plug. 0:NO type; 1:NC type.

20,Control Mode of Chuck(0:Single, 1:Double)
    It sets the control mode of chuck, 0:Single control signal for Chuck; 1:Double control signal for Chuck.
    P20=0, one output point for Chuck, M10:clamp chuck, M11: unclamp chuck;
    P20=1, two output points for Chuck, M10: output M10(PIN21_CN3 Plug) to clamp chuck; M11: output M71(PIN9_CN10 Plug) to unclamp chuck.

21,Control Mode of Thumstall(0:Single, 1:Double)
    It sets the control mode of tailstock, 0:Single control signal for thumbstall, also tailstock; 1:Double control signal for Thumbstall.
    P21=0, one output point for thumbstall, M79:thumbstall forward, M78, also M79 is invalid: thumbstall backward;
    P21=1, two output points for thumbstall, M79: output M79(PIN22_CN3 Plug) to forward thumbstall; M78: output M73(PIN22_CN10 Plug) to backward thumbstall.

22,External Switch for Chuck(0:No, 1:Yes)
    It sets if there is external switch for control chuck. 0:No,without switch for chuck;1:Yes,with external switch for chuck. Input point is M16,PIN12_CN10 Plug.
    Note: It is reciprocating signal. one is valid,clamp chuck; anthter is invalid,loose chuck.

23,External Switch for Tailstock(0:No, 1:Yes)
    It sets if there is external switch for control tailstock,0:No,without switch for tailstock; 1:Yes,with switch for tailstock. Input point is M14,PIN24_CN10 Plug.
    Note:Reciprocating signal.one is valid,tailstock forward;anther is invalid,tailstock backward.

24,Time of Chuck(s)
    It sets holding time of output M10/M11 for chuck. Unit:second. 0 means M10/M11 are long signal, also always output M10/M11 is valid.

    24-1,M10 Long Signal(0:No, 1:Yes)
        It sets the control mode of M10, 0 means short signal, holding time of output M10 can be set by parameter, 1 means long signal, M10 always valid

    24-2,M71 Long Signal(0:No, 1:Yes)
        It sets the control mode of M71, 0 means short signal, holding time of output M71 can be set

by parameter, 1 means long signal, M71(M11) always valid.

24-3,Chuck M10 or M11 boot [0:M10, 1:M11]
    It sets cnc system output M10 or M11 when booting system, 0:Output M10, 1:Output M11.
    Note: If double outputs for chuck, M11,also output M71, PIN9_CN10 Plug.

25,Time of Tailstock(s)
    It sets holding time of output M79/M78 for tailstock. Unit:second. 0 means M79/M78 are long signal, also always output M79/M78 is valid.

25-1,M79 Long Signal(0:NO, 1:Yes)
     It sets the control mode of M79, 0 means short signal, holding time of output M79 can be set by parameter, 1 means long signal, M79 always valid

25-2,M73 Long Signal(0:NO, 1:Yes)
     It sets the control mode of M73(M78), 0 means short signal, holding time of output M73 can be set by parameter, 1 means long signal, M73(M78) always valid.
     Note:If double outputs, M78, also output M73, PIN22_CN10 Plug.

26,Type of Emergency Stop1(0:NO type, 1:NC type)
    It set thee type of switch for 1st Emergency Stop, which is at panel. 0: NO type switch; 1:NC type switch for 1st emergency stop.

27,Type of Emergency Stop2(0:NO type, 1:NC type)
    It set thee type of switch for 2nd Emergency Stop, which is at panel. 0: NO type switch; 1:NC type switch for 2nd emergency stop.Input is PIN5_CN11 Plug.

28,Run/Pause Output(0:No, 1:Yes)
    It sets if output the condition of Running/Pause. 0:No, don't output condition of Run/Pause; 1:Yes, output the condition of Run/Pause. And M69, PIN21_CN10 plug , output Running condition; M65,PIN20_CN10 plug, output Pause condition.
    Note:These signals can be used to indicator for show condition of machine.

29,Alarm Output(0:No, 1:Yes)
    It sets if output the condition of Alarm. 0:No, don't output condition of Alarm; 1:Yes, output the condition of Alarm, Output point is M67,PIN8_CN10 Plug.
    Note: The signals can be used as machine-protecion or show condition of machine.

30,Language(1:Chinese, 0:English)
    It sets the language of system. 1: Set language to Chinese ; 0: set to English.

31,Use Inner PMC(0:No, 1:Yes)
    It sets if use inner PMC function; 0:No, no use; 1:Yes, use.
    Warning:It is usally used for adjusting parameters. system must use inner IO PMC when actual use,also

P31=1. Otherwise system will works abnormally.

32,Use High-Speed Inner PMC(0:No, 1:Yes)

It sets if use high-speed inner PMC for IOs. 0:No,don't use PMC; 1: Yes,use High-Speed PMC.

Warning:It is usally used for adjusting parameters. system must use High-Speed PMC when actual use,also P32=1. Otherwise system will works abnormally.

33,HY as Running Key(0:No, 1:Yes)

It sets if make HY input point, PIN9_CN11 plug as external key for RUN signal. 0:No, HY don't as RUN input signal; 1:Yes,HY as RUN signal.

Attention: Because HY singal maybe as Y(C)-axis selection signal, so when P33=1,then P1 in Axis&Other paramter only set as 0.

34,HA as Halt Key(0:No, 1:Yes)

It sets if make HA input point, PIN10_CN11 plug as external key for STOP signal. 0:No, HY don't as Halt input signal; 1:Yes,HA as Halt signal.

Attention:Because HA singal maybe as A-axis selection signal, so when P33=1,then P1 in Axis&Other paramter only set as 0.

35,Soft-Limit is Valid when no homing(0:No, 1:Yes)

It sets if soft-limit is valid when not homing. 1:Yes,valid, 0:No,invalid.
Attention:the set of this parameter is related to operation habits.

36,Time(Year-Month-Day-Hour-Minute)

It sets time and date of system. After set well,system will take this setting time as basic,according to inner timer count time and shows in displayer.
Example:13:33, 16th, March, 2017; set P36=2017-03-16-13-33, & Enter.

37,Rate of RS232

It sets rate of communication with RS232. Different value corresponding to different rate:[0=7200;1=9600;2=14400;3=19200;4=38400;5=57600; 6=115200].
Attention:The Rate of both CNC & PC must keep same.

38,Latched for Rapid Key(8:Yes)

It sets if latched for "Rapid" key on panel. 8:Yes. Reciprocating control.

41,Backup Current Parameters

It is for backup current parameters as ex-factory set. It is used for backup parameters after debugging is finished well, easy to maintain.
Attention: select this paramter,press "Enter" key twice,finish backups.

42,Recovery Backup Parameters.

It is for recovery current parameters to ex-factory set. It is normally used for recovery to

ex-factory set when parameters set wrong.

Attention: after finish this operation,last paramters will be occpied.

120,Direction of Manual Feeding Key

It sets feeding direction of manual feeding key of each axis on panel.

Value	Function
+4	Direction of Z_Manual Feeding is opposite;
+8	Direction of C(Y)_Manual Feeding is opposite;
+16	Direction of X_Manual Feeding is opposite;
+32	Direction of A_Manual Feeding is opposite;

200,X_Feedback Allow Error During Moving (Pulse) [>1]
201,Y_Feedback Allow Error During Moving (Pulse) [>1]
202,Z_Feedback Allow Error During Moving (Pulse) [>1]
203,A_Feedback Allow Error During Moving (Pulse) [>1]
204,B_Feedback Allow Error During Moving (Pulse) [>1]

If follow error bigger than this parameter,system will alarm.(the parameter is effective when it >1). #200/#201/#202/#203/#204 stand for X/Y/Z/A/B-axis. Press "G"key in diaginous screen to clear alram and command position & feedback position after alarm.

205,X_Feedback Allow Error When Stopping (Pulse) [>1]
206,Y_Feedback Allow Error When Stopping (Pulse) [>1]
207,Z_Feedback Allow Error When Stopping (Pulse) [>1]
208,A_Feedback Allow Error When Stopping (Pulse) [>1]
209,B_Feedback Allow Error When Stopping (Pulse) [>1]

If follow error bigger than this parameter when X-axis stop,system will alarm.(the parameter is effective when it >1). #205/#206/#207/#208/#209 stand for X/Y/Z/A/B-axis. Press "G"key in diaginous screen to clear alram and command position & feedback position after alarm.

210, Numerator of X_Electron Gear for Position Feedback
211,Numerator of Y_Electron Gear for Position Feedback
212,Numerator of Z_Electron Gear for Position Feedback
203,Numerator of A_Electron Gear for Position Feedback
214,Numerator of B_Electron Gear for Position Feedback

The paramter is numerator of X-axis electron gear,and also input screw lead and encoder lines,for example,when screw leas is 6mm,encoder's resolution is 2500PPR,input : L6000M2500. #210/#211/#212/#213/#214 stand for X/Y/Z/A/B-axis.
Special attention:
1)when input L***M***,it needs to set numerator and denominator of electron gear of each axis.
2)when series port read data of absolutely encoder,it must input in this way.

215,Denominator of X_Electron Gear for Position Feedback
216,Denominator of Y_Electron Gear for Position Feedback
217,Denominator of Z_Electron Gear for Position Feedback
218,Denominator of A_Electron Gear for Position Feedback

219,Denominator of B_Electron Gear for Position Feedback

The paramter is denominator of X-axis electron gear,and also input screw lead and encoder lines,for example,when screw leas is 6mm,encoder's resolution is 2500PPR,input : L6000M2500. #215/#216/#217/#218/#219 stand for X/Y/Z/A/B-axis.

Special attention:

    1)when input L***M***,it needs to set numerator and denominator of electron gear of each axis.

    2)when series port read data of absolutely encoder,it must input in this way.

500,Series Number of Ex-Factory

It sets series number of ex-factory.

501,Shift Color Display of Screen(1:No, 8:Yes)

It sets if shift color display of screen, 1: No shift; 8:Yes,shift to black color.

601,Define Parameters for Step

It sets current parameters to ex-factory set for step system when machine tool is configured with stepper motor&driver.The operation is done before debugging.

602,Define Parameters for Servo

It sets current parameters to ex-factory set for servo system when machine tool is configured with servo motor&driver.The operation is done before debugging.

900,Display User-define Dialog Box[1:No, 4:Some, 8:All]

It sets if diplay user-define dialog box. 1: No display; 4:Yes,display some.

901,Homing Sequence of Axis(5bits)

It sets homing sequence of each axis.Value is 5bits.D0 bit is 0. 1:X, 2:C(Y), 3:Z, 4:A.   Eg.: P901=31240, Homing sequence is Z->X->Y->A.

910,High-Speed Input of M18/M22/M24/M28 for G31/G311(0:No, 1:Yes)

It sets if inputs of M18/M22/M24/M28 are high-speed input for G31/G311 command; 0:No, don't as input for G31/G311; 1:Yes.

911,Use M18_Teachin, M28_Record(0:No, 1:Yes)

It set if use M18 as Teachin function, M28 as Set function of Teachin.

912,"Reset"key reset Outputs(0:No, 1:Yes)

It sets if "Reset"key reset output points. 0:No reset outputs; 1: Yes, reset.

2.6 Workpiece Coordinate Parameter

CNC system supports multiple coordinate system function, also 6 workpiece coordinate system(G54-G59), plus 10 workpiece coordinate system(G54.1-G54.10) and a machine coordinate system G53. A machining program can set a workpiece coordinate system can also be set up multiple workpiece coordinate system, the workpiece coordinate system can be changed to move its origin. That is the value of the parameter in the coordinates of its own coordinate origin (zero) coordinate value in the machine coordinate system.

In Lathe System,normally user only need one coordinate system(G53 coordinate system), also Machine Coordinate System.

G54 to G59 can be set with 6 workpiece coordinate systems, the coordinate system settings interface can be modified 6 origin of the workpiece coordinate system coordinate value in the machine coordinate system.

P	Coordinate Parameter	Ex-Value
1-0	Current Workpiece Coordinate Set [G54-G59]	54
1-1	X_Workpiece Coordinate (G54-G59)	0.000
1-2	Y(C)_Workpiece Coordinate (G54-G59)	0.000
1-3	Z_Workpiece Coordinate (G54-G59)	0.000
1-4	A_Workpiece Coordinate (G54-G59)	0.000
2-0	Current Workpiece Coordiante Set [G54.1-G54.10]	1
2-1	X_Workpiece Coordinate (G54.1-G54.10)	0.000
2-2	Y(C)_Workpiece Coordinate (G54.1-G54.10)	0.000
2-3	Z_Workpiece Coordinate (G54.1-G54.10)	0.000
2-4	A_Workpiece Coordinate (G54.1-G54.10)	0.000
1	X_Workpiece Coordinate of G54	0.000
2	Y(C)_Workpiece Coordinate of G54	0.000
3	Z_Workpiece Coordinate of G54	0.000
4	A_Workpiece Coordinate of G54	0.000
6	X_Workpiece Coordinate of G55	0.000
7	Y(C)_Workpiece Coordinate of G55	0.000
8	Z_Workpiece Coordinate of G55	0.000
9	A_Workpiece Coordinate of G55	0.000
11	X_Workpiece Coordinate of G56	0.000
12	Y(C)_Workpiece Coordinate of G56	0.000
13	Z_Workpiece Coordinate of G56	0.000
14	A_Workpiece Coordinate of G56	0.000
16	X_Workpiece Coordinate of G57	0.000
17	Y(C)_Workpiece Coordinate of G57	0.000
18	Z_Workpiece Coordinate of G57	0.000
19	A_Workpiece Coordinate of G57	0.000
21	X_Workpiece Coordinate of G58	0.000
22	Y(C)_Workpiece Coordinate of G58	0.000
23	Z_Workpiece Coordinate of G58	0.000
24	A_Workpiece Coordinate of G58	0.000
26	X_Workpiece Coordinate of G59	0.000
27	Y(C)_Workpiece Coordinate of G59	0.000
28	Z_Workpiece Coordinate of G59	0.000
29	A_Workpiece Coordinate of G59	0.000
......		

Note:

1. When CNC controller is with related axes,which has related functions for feeding axes.

2. Input "E" to clear coordinate value.

3. Value Set for parameter of workpiece coordinate system is with increment type.

3. Each alone G54.1-G54.10 workpiece coordinate set just don't display on user manual.

Explanation about Workpiece Coordinate System:
  1-0.Current Workpiece Coordinate Set [G54-G59]
     It is for select current workpiece coordinate from G54 to G59.

1-1 X_Workpiece Coordinate (G54-G59)
1-2 Y(C)_Workpiece Coordinate (G54-G59)
1-3 Z_Workpiece Coordinate (G54-G59)
1-4 A_Workpiece Coordinate (G54-G59)
    It sets value of related axis on workpiece coordinate system, which is set by P1-0. The value is set with Increment type.

2-0 Current Workpiece Coordiante Set [G54.1-G54.10]
     It is for select current workpiece coordinate from G54.1 to G54.10

2-1 X_Workpiece Coordinate (G54.1-G54.10)
2-2 Y(C)_Workpiece Coordinate (G54.1-G54.10)
2-3 Z_Workpiece Coordinate (G54.1-G54.10)
2-4 A_Workpiece Coordinate (G54.1-G54.10)
    It sets value of related axis on workpiece coordinate system, which is set by P2-0. The value is set with Increment type.

2.6.1 How to set up the workpiece coordinate system?

    We set up the workpiece coordinate in the condition of Manual,the steps are following:
    a).Press "MDI"key,select corresponding workpiece coordinate system(G54-G59), **Example,select G55 coordinate,input G55 ,Press 'Enter', 'Start',selected G54 Coordinate.**
    b).Move machine to suitable position that easy to measure in manual,and measured the related coordinate value between this point (zero point in the workpiece)to Home of G53 coordinate system(also machine coordinate system).
    c).Press"Setup",press "X"key and 'Enter' ,'insert the measured value',and 'Enter'.
    d).Press "Setup",press "Z"key and 'Enter' ,'insert the measured value',and 'Enter'
    e).Press"Setup",press "Y/C"key and 'Enter' ,'insert the measured value',and 'Enter'.
    f).Press "Setup",press "A"key and 'Enter' ,'insert the measured value',and 'Enter'
    Done well now.Enter different workpiece coordinate system,it will show the corresonding value,which also is offset value between workpiece coordinate system and machine coordinate system(G53).

2.6.2 How to adjust the offset value after set well?

    If set up workpiece coordinate system well,when it needs to adjust the offset value,it could be set by enter the workpiece coordinate parameter,steps is as follow:
    In the coordinate parameter screen,selected the parameter,press "Enter",and pop up dialog,input the offset value(also Increments,example:offset 10mm in negative direction,also input -10),press "Enter".It is okay.
    Explanation:1.when the parameter is altered well,the coordinate main screen will refresh the corresponding coordinate value soon.
    2.brackets in these parameters,it means the sum ,which is offset or adjust every time.It is suitable to look for the offset every time.

2.7 Password

The password is order to avoid modified accidentally and ensure the system work in normal condition.The system adopt three permissions, "CNC Factory", "Machine Factory" and "User".

The original condition is "CNC factory" is set, "Machine factory" and "User" isn't set.

After set new password(set new password ,it need original password),please remember the new password ,and the original password wasn't work.

Attention:the password must be 6 bit data,the data could be number and letter.

password setting include:

1,Is enable CNC Co.'s password ?

It is for inner parameter,it couldn't be operated.

2,Is enable Machine Co.'s password ?

Display and set the parameter that is related to machine's configuration.

3,Is enable User's password ?

It is for whether display and set the parameter that is related to processing.

4,Modify CNC Co.'s password:

5,Modify Machine Co.'s password:

6,Modify User's password:

7,curry word time: (days)

8,Version of Operational Software.

Ex-factory Data

2.8 Redeem

Press "Redeem" key to enter interface of redeem in any condition.

Remark	Function
F1-Radius	Press "F1" key to enter Radius Compensation Interface
F2-Length	Press "F2" key to enter Length Compensation Interface
F3-ACLEA	Press "F3" key to clear all compensation value.
F4-CLEAR	Press "F4" key to clear current compensation value.
F5-SetTool	Press "F5" key to set tool {same to Setup key on panel}
F6-ToolPoit	Press "F6" key to enter list of ToolPosit
F7-Set	Press "F7" key to set total tool number
F8-CANCEL	Press "F8" key to return back main interface

2.8.1 Radius Compensation

Press "F1" key to entering radius compensation interface on Redeem.

Fig2.8.1 Radius Compensation Interface

Setting Steps: Press "↑ ↓" key to move cursor to related tool and press "Enter" key to popup a dialog box "Input T# tool radius compensate R:", input radius value of corresponding tool, press "Enter" at last.

Note: Value input is with absolute type.

2.8.2 Length of redeem

Press "F2" to enter Length compensation interface on Redeem.

| Man Con | N00000 | 2017-04-06 17:24 |

01	X:	0.000	Z:	0.000
02	X:	0.000	Z:	0.000
03	X:	0.000	Z:	0.000
04	X:	0.000	Z:	0.000
05	X:	0.000	Z:	0.000
06	X:	0.000	Z:	0.000
07	X:	0.000	Z:	0.000
08	X:	0.000	Z:	0.000

Program SZGH

Instruction code

G53
          T0000

Machine Status

M05   M09   M10
M78   M33   M44

G00   X100%
F100   X100%
S0   X100%

Machine Coor

X   0.000
Z   0.000

PartTime 0:0
PartNo   0
SPrpm   0

No Alarm

| F1 Radius | F2 Length | F3 ACLEA | F4 CLEAR | F5 SetTool | F6 ToolPoit | F7 Set | F8 CANCEL |
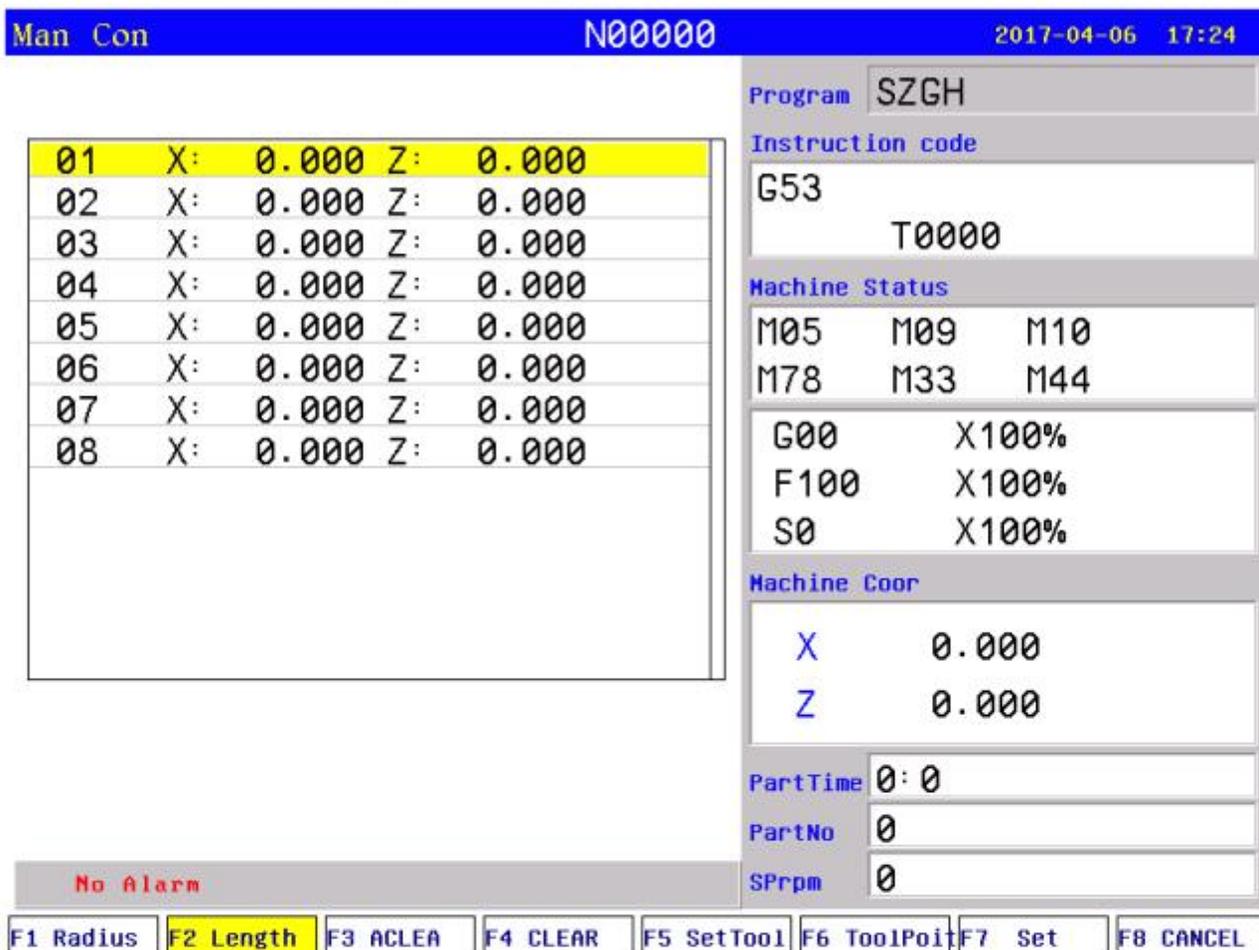
Fig2.8.2 Length Compensation Interface

Steps of modifying length compensation:

Press "↑↓" key to move cursor to the corresponding tool number and press "Enter" to popup a dialog box, import the modifying axis into the dialog box and import the modifying value(import 0.05 to plus 0.05, import -0.05 to reduce 0.05), press "Enter" to confirm. The system calculates current value of redeem after finishing setting.

Method of Automatical Tool Set

1)Move machine tool to a position where is easy to measure coordinate of tools

2)Press "↑↓" to move cursor to corresponding tool number

3)Press "F5" to popup a dialog box, "input axis name:[X,Z]"

4)Press X/Z key, "Input Coordinate Axis(mm): X/Z", input coordinate value

4)Press "Enter" to confirm.compensation of corresponding axis is set well.

The system refresh current value of redeem after finishing setting automatically.

Method of initializing the length compensation value of tool:

Press "F3" or "F4" to initialize length compensation of all or current tool.

Note: Value input is with increment type.

2.8.3 Tool Sets List

Press "F6" to enter posit tool interface in redeem. The parameter is used to set type of tool sets when adopting radius compensation of tool.

```
Man  Con                          N00000            2017-04-06  17:25
                                            ┌──────────────────────────────┐
 ┌──────────────────────────────────┐       │ Program  SZGH                │
 │ ToolPoint 01        0            │        ├──────────────────────────────┤
 │ ToolPoint 02        0            │        │ Instruction code             │
 │ ToolPoint 03        0            │        │ G53                          │
 │ ToolPoint 04        0            │        │         T0000                │
 │ ToolPoint 05        0            │        ├──────────────────────────────┤
 │ ToolPoint 06        0            │        │ Machine Status               │
 │ ToolPoint 07        0            │        │ M05    M09     M10           │
 │ ToolPoint 08        0            │        │ M78    M33     M44           │
 │                                  │        │  G00       X100%             │
 │                                  │        │  F100      X100%             │
 │                                  │        │  S0        X100%             │
 │                                  │        ├──────────────────────────────┤
 │                                  │        │ Machine Coor                 │
 │                                  │        │   X       0.000              │
 │                                  │        │   Z       0.000              │
 └──────────────────────────────────┘       ├──────────────────────────────┤
                                             │ PartTime 0:0                 │
    No Alarm                                 │ PartNo   0                   │
                                             │ SPrpm    0                   │
 ┌─────────┐                                          ┌──────────┐
 │F1 CLEAR │                                          │F8 CANCEL │
 └─────────┘                                          └──────────┘
```
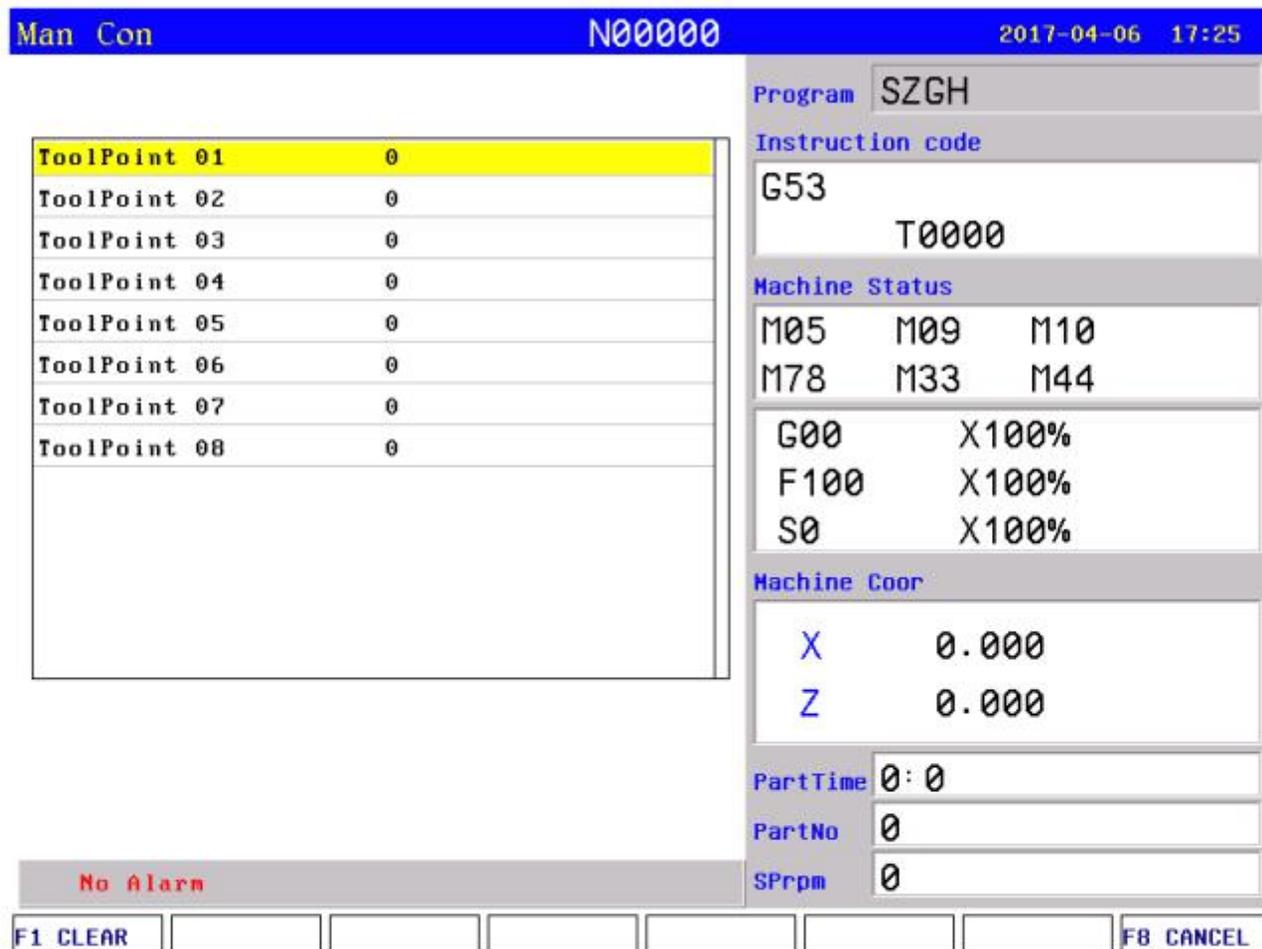
Fig2.8.3 Tool Posit Interface

Step of setting: Press "↑ ↓" to move cursor to corresponding tool number and press "Enter" to popup a dialog box, input the code of corresponding tool's types and press "Enter" to confirm.

Press "F1" key to initialize all the kinds of tool point to 0.

2.8.4 Set quantity

Press "F7" key to popup a dialog box On Redeem interface to set total tools.

```
┌──────────────────────────────────────────────┐
│  Input tool total count:                     │
│      ┌──────────────────────────────────┐    │
│      │ 3                                │    │
│      └──────────────────────────────────┘    │
└──────────────────────────────────────────────┘
```

Including sum tools of electrical tools , linear tools and toolpost.
The CNC system supports 99 pcs tools max.

2.9 Screw Compensation

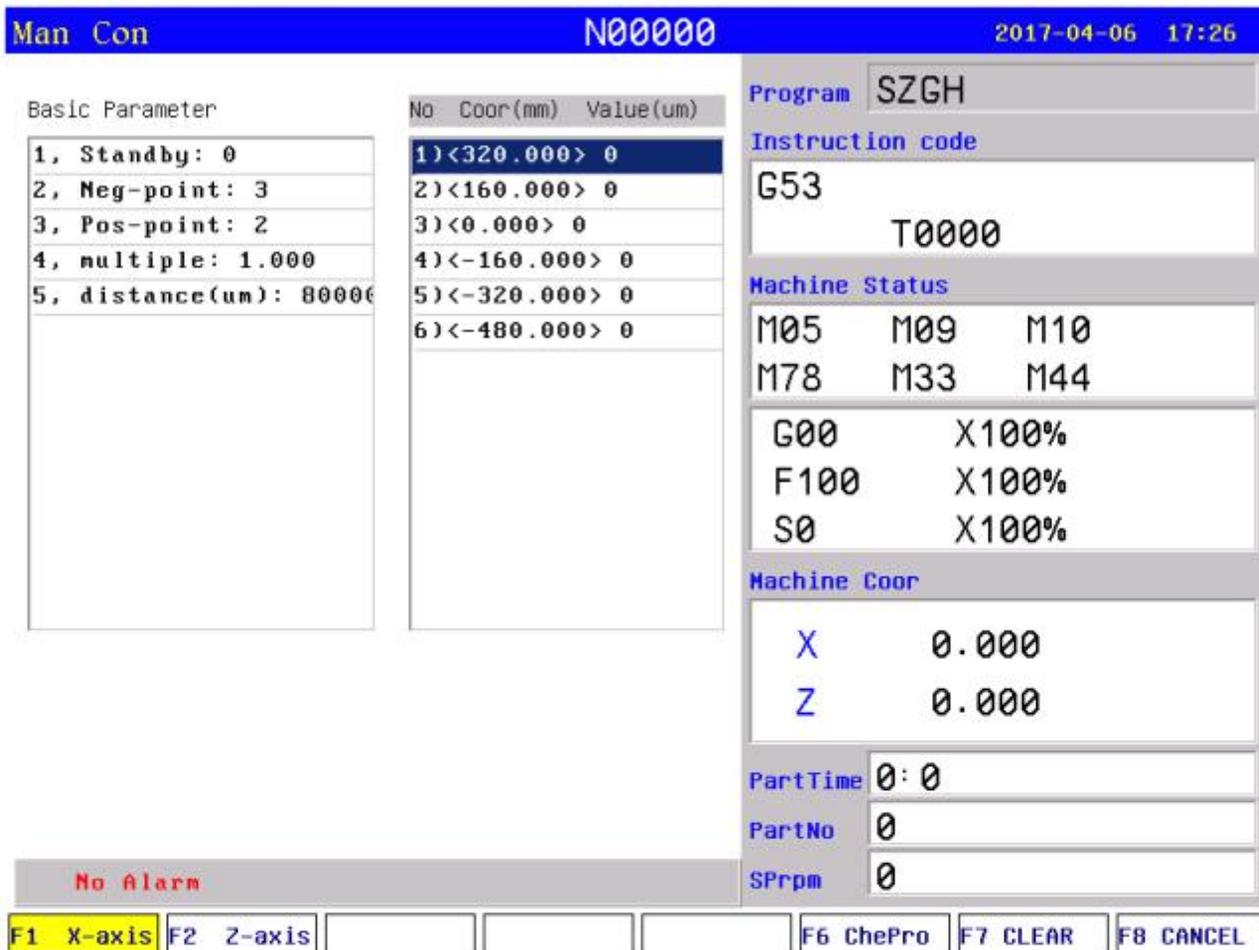Press "Parameter" three times to enter screw compensation interface.

Fig2.9.1 Screw compensation interface

Screw compensation is used for automatical compensating the error of screw pitch, which due to the error of screw pitch to affect accuarcy of machine. The system adopts built-in screw compensation: Take machine's home position, also datumn point as the starting point when debugging, measured the error curve of screw, studied out the correctional curve according to the error curve, import the value of correctional curve into the correctional parameter and system is going to compensate according to the parameter in automatical running.

Screw compensation by the axis as the unit to set storage, set X/Z/C/A/B axis separately, by pressing "F1" "F2" "F3" "F4" "F5" to switch; Every axis of screw compensation interface has tow areas(basic parameter and set the compensation), by pressing "→ ←"to move the cursor to realize.

Storage of screw compensation curve is with each axis, set screw compensation of X Y Z A B axis separately, by pressing "F1" "F2" "F3" "F4" "F5" to switch; Every axis of screw compensation interface has two areas(basic parameter and set the compensation), which switch is through pressing "→ ←"to move the cursor .

A) Basic parameter:

Press "↑ ↓" to select current basic parameter to set in basic parameter, press "Enter" to popup a dialog box to import the error compensation of every axis and import the basic information of

screw compensation.

Basic parameter of every axis' error compensation of screw pitch includes as follows:

1. Reserve.

2. Backward checking points.

It is set for points number of compensation in negative direction.

3. Forward checking points.

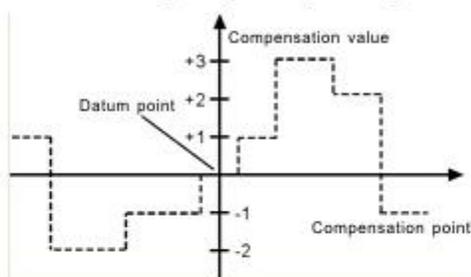It is set for points number of compensation in positive direction.

4. Multiple.

It is set for rate of compensation, also actual value=set value * multiple .

5. Distance (um).

It is set for the distance between two compensate points.

Note: Number of compensation points can be set freely, max points of each axis is 300.

B) Set compensation value (No. Coor(mm)   Value(um)):

In the area of setting compensation value, it will shows the value of compensation and every axis' error compensation point of screw pitch. Press "↑ ↓ PgDn PgUp" to select current compensation point and press "Enter" to popup a dialog box to import the value of current compensation point.

Test program generation automatically

Automatical generate a program of laser interferometer to check the screw compensation. Enter the screw compensation screen and set basic parameters well, press "B" key to check program" to detect program to popup a dialog box and press "Enter" to generate corresponding checking program of screw compensation.

System calculates the distance of compensation points automatically according to basic parameter. Distance is uniform, which could be set according to different axis, and user can set compensation value of each point (System requires input absolute value, relating to value of datum point).

Example1: Linear axis: when length of travel is -400mm~+800mm, distance is 50mm:
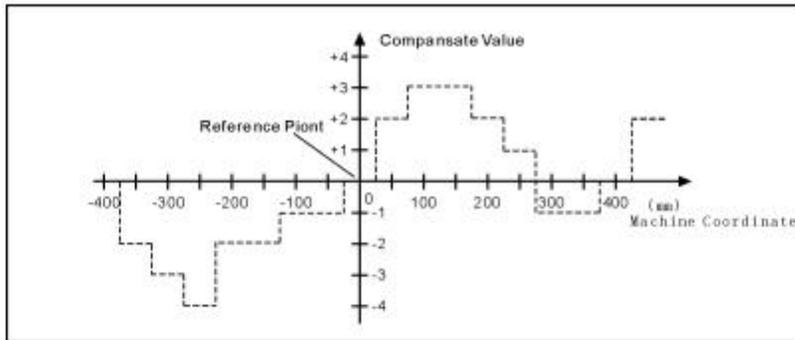
Basic parameters set as follows:

1)Backward checking points: 8

2)Forward checking points: 16

3)Multiple: 1

4)Distance(um): 50000

Corresponding compensation point and value:

| No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	.	25
Value	+2	+1	+1	-2	0	-1	0	-1	+2	+1	0	-1	-1	-2	0	+1	+2		+1

The contrasted chart of compensation points and value as follows:

Note: Zero point is reference point,don't account into checking point.

Example 2: Rotorary axis: when movement per revolution is 360°,interval of points 45°,Basic parameters set as follows:
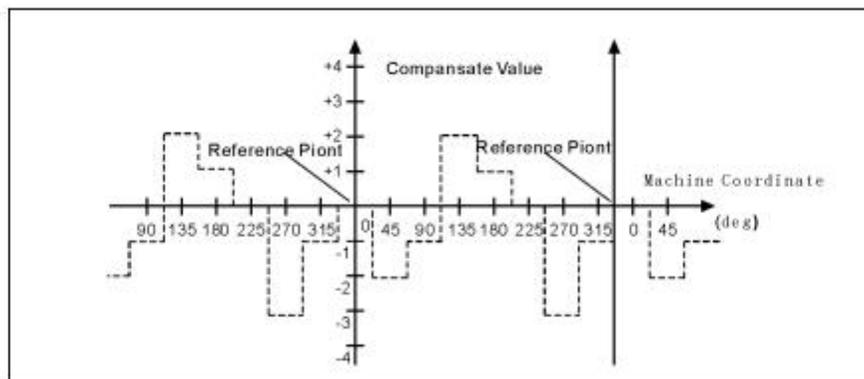1) Backward checking points: 0
2) Forward checking points: 8
3) Multiple: 1
4) Distance(um): 45000
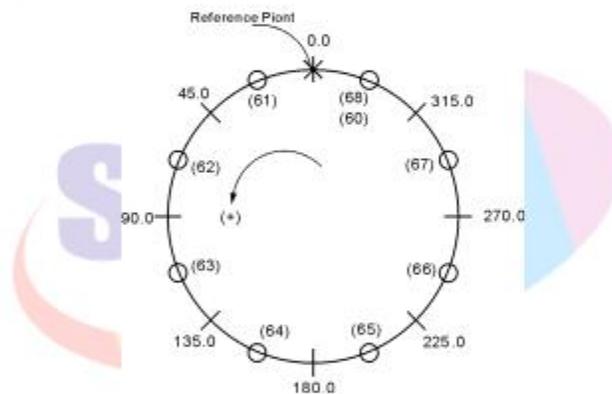
Output compensation value at corresponding point:

NO.	0	1	2	3	4	5	6	7	8
VALUE	+1	-2	+1	+3	-1	-1	-3	+2	+1

Compensation point and value contrast:

Note: 1. In the system, when axis is rotary axis, the coordinate value is 0~360. 0 and 360 are at same position:
Example: When input A0 & A360 , both will rotate to zero position.
   2.Zero point is reference point,don't account into checking point.

Chapter 3 Installation & Connection

3.1 System installation and connection

At first, users should check whether the hardware is complete, unwounded and compatible, such as: cnc system, driving power, servo motor, photoelectric encoder, electric tool carrier.

The installation of cnc system must be fastened tightly, with some spaces around to ensure the ventilation of air. Panel should be put in a place where it is not only convenient to operate and but also able to avoid hurt of heating by scrap iron.

Intense current, week current must be put separately, cnc system and driver should be possibly away from the machine intense current. In order to reduce interference, all signal cables should be kept away from AC contactor. Photoelectric encoder, limit, basic point signal are advisably not to be connected directly to cnc system through intense current box. All power cords must be earthing.

3.2 System installation dimension

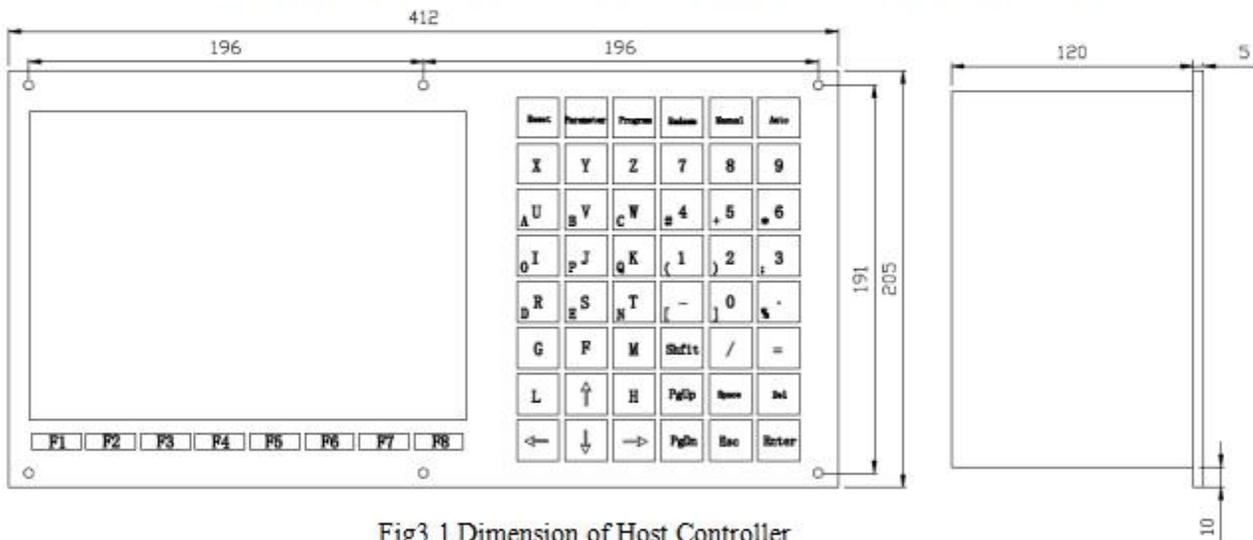This system has two parts of cnc controller, host controller & operational panel
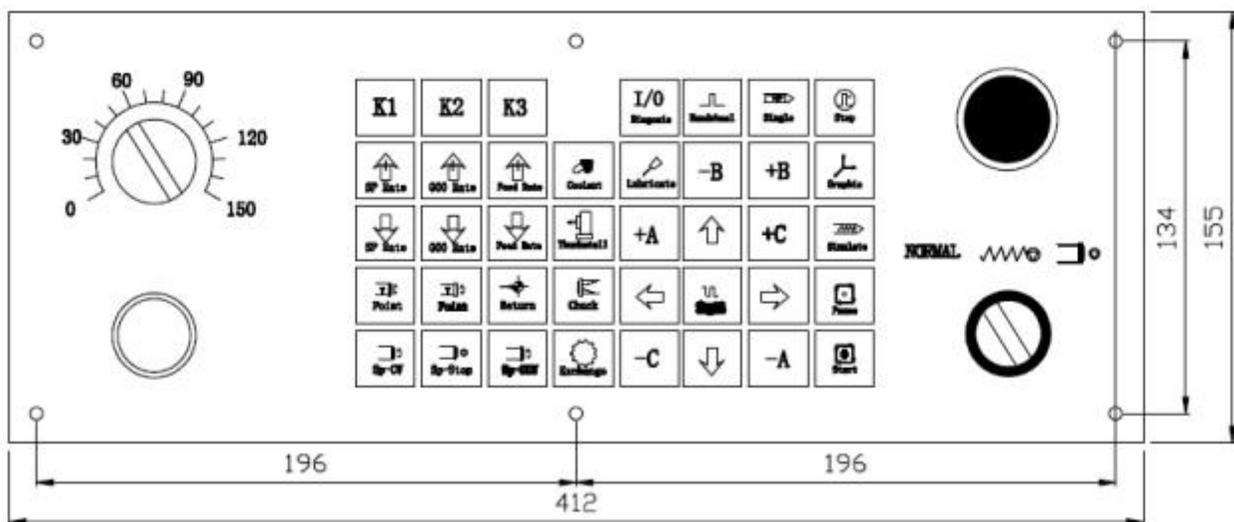

Fig3.1 Dimension of Host Controller

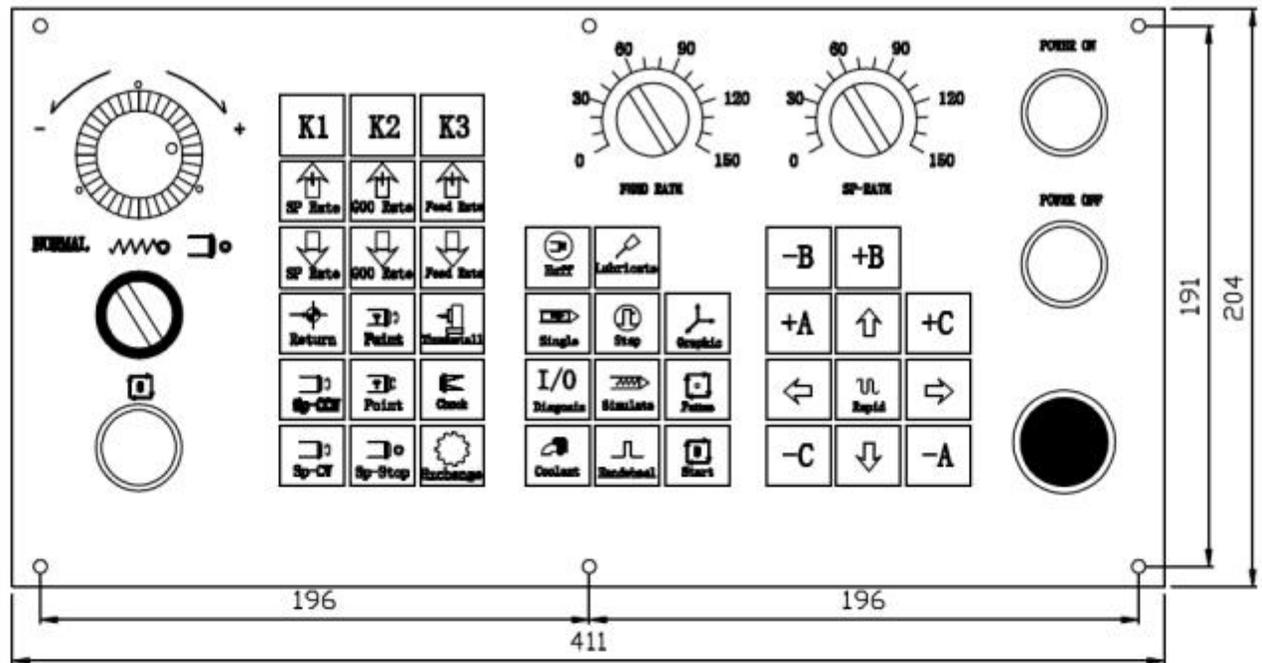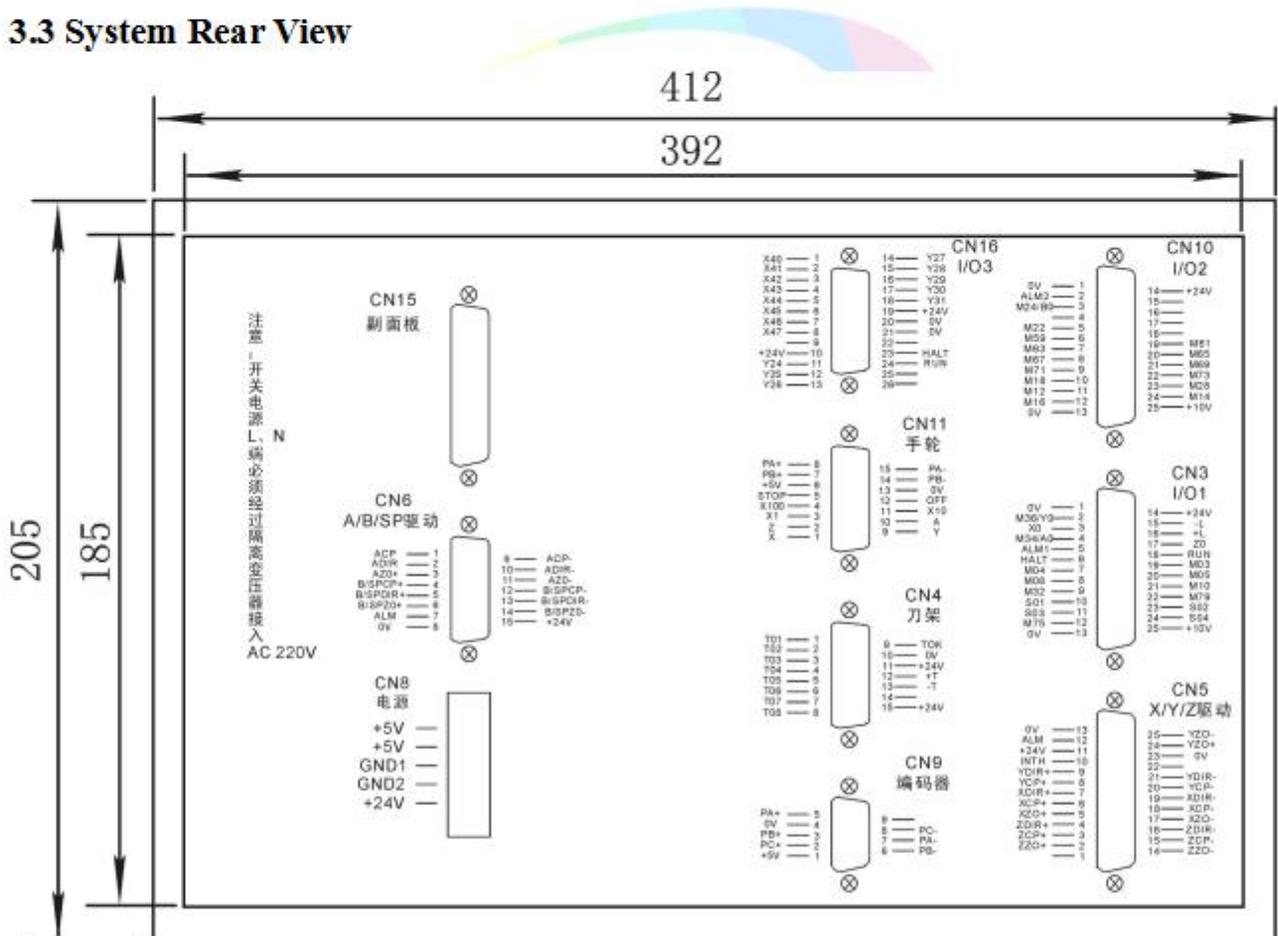Fig3.2 Dimension of A type & B type Operational Panel

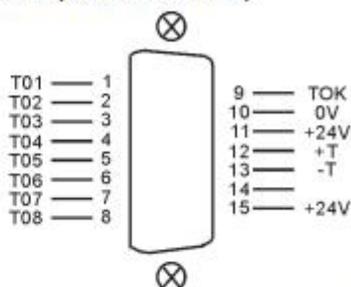Fig3.3 Dimension of C type & E type Operational Panel

3.3 System Rear View

Attention: switching power supply L, N must be connected to AC 220V, current 0.5A through isolation transformer.

3.4 Interface Connection Graph

3.4.1 CN4 Turret Socket (Female/DB15)


```
T01 ——— 1        9 ——— TOK
T02 ——— 2       10 ——— 0V
T03 ——— 3       11 ——— +24V
T04 ——— 4       12 ——— +T
T05 ——— 5       13 ——— -T
T06 ——— 6       14 ———
T07 ——— 7       15 ——— +24V
T08 ——— 8
```

CN4 Turret signal with Female socket DB15				
Signal	Pin	I/O	function	Valid
0V	10	OUT	0V	0V
+24V	11,15	OUT	+24V	+24V
+T	12	OUT	Control CW Rotation of Turret	0V
-T	13	OUT	Control CW Rotation of Turret	0V
T1	1	IN	T1 Position Input Signal	0V
T2	2	IN	T2 Position Input Signal	0V
T3	3	IN	T3 Position Input Signal	0V
T4	4	IN	T4 Position Input Signal	0V
T5	5	IN	T5 Position Input Signal	0V
T6	6	IN	T6 Position Input Signal	0V
T7	7	IN	T7 Position Input Signal	0V
T8	8	IN	T8 Position Input Signal	0V
TOK	9	IN	Detect Lock signal of Turret	0V

System can control 1-99 tools. Press "C-set" to set total tools number in Redeem interface, Starting number of linear tool is set in Tool parameter.

No.1 parameter: Activate the function of electrical tool to select electrical tool or tool post. [1 means Yes, 0 means No]

No.2 parameter: Activate tool number when using electrical change into tool post, if the electrical tool is 4, set the number is 5 to switch to tool post.

No.4 parameter: The maximum time for tool positive rotate. Failed to find tool position beyond the time, system will stop rotating tool and alarm. (Unit: second)

No.5 parameter: Delay time after tool positive rotate to check the tool position signal. (ms)

No.6 parameter: Delay time after tool stop. (ms)

No.7 parameter: Tighten time of tool reverse rotate (ms).

No.9 parameter: To set whether if it checks the key-locked switch after electrical tool reverse rotate to the position (total signal TOK), default is not to check.

No.10 parameter:C Tool radius compensation's establish(0 mean A,1 mean B)

No.11 parameter:C Tool radius compensation's cancel(0 mean A,1 mean B)

No.20 parameter:Active tool mode[1 mean normal,0 mean coding tool]

When lathe is with coding tool(encoder turret),system must restore PLC of coding turret.The control program can be edited by press "N" in Diagousis.

Attention:

1. All the input or output is for system, input is from exterior signal to system, the output is from system signal to external.

2. When choosing the electrical appliance plate, +T and –T control single contact middle relay, user should install two AC contactors of +T and –T.

System output signal +T、-T:
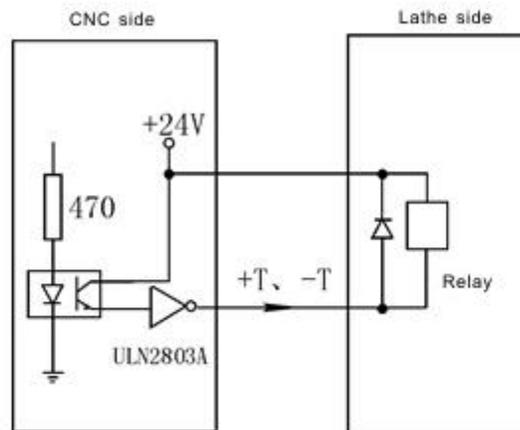
Attention:it must puls a reverse diode in order to cancel reverse current.

Tool input T1～T8、TOK signal：
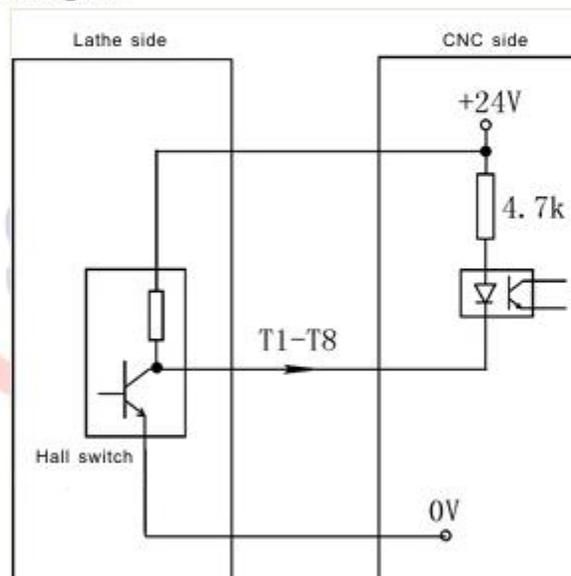
3.4.2 CN9 Spindle Encoder Socket (Female/DB9)
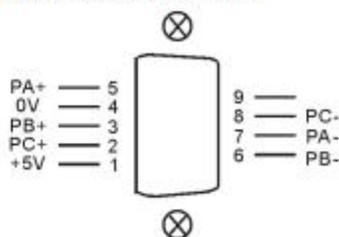
CN9 SP_Encoder signal with Female socket DB9				
Signal	Pin	I/O	Function	Valid
0V	4	OUT	0V	0V
+5V	1	OUT	+5V	+5V
PA+	5	IN	A Phase Positive signal	5V
PA-	7	IN	A Phase Negative signal	5V
PB+	3	IN	B Phase Positive signal	5V
PB-	6	IN	B Phase Negative signal	5V
PC+	2	IN	Z Phase Positive signal	5V
PC-	8	IN	Z Phase Negative signal	5V

Attention:

1. The output signal of encoder adopt the output way is line output, the power supply is +5V.

2. The signal line must adopt shielded twisted pair cable, the length is 20m at most.

The input signal of encoder PA PB PC:
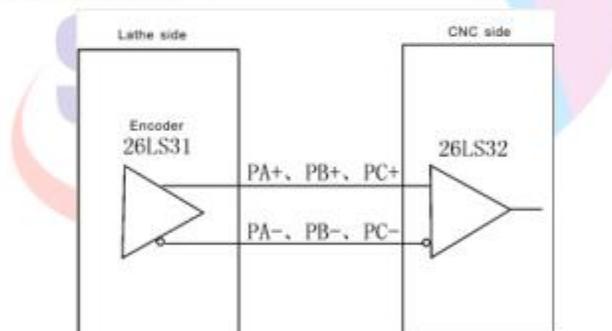
Pay attention:

When machine is configured with inverter+ac motor and customer want to do some special processing,like G84, it needs to fix an encoder to spindle motor.

P412: number of spindle teeth

413, number of encoder teeth

When transmission ratio of spindle and encoder not as 1:1, please modify P412&P413 in Axis parameter when teeth of spindle isnot more than teeth of encoder;

If teech of spindle is more than teeth of encoder, it needs to select adpater plate of SZGH;

Note: it must be integer mutliple relationship about teeth between spindle & encoder.

3.4.3 CN3 IO1 Control Socket (Female/DB25)
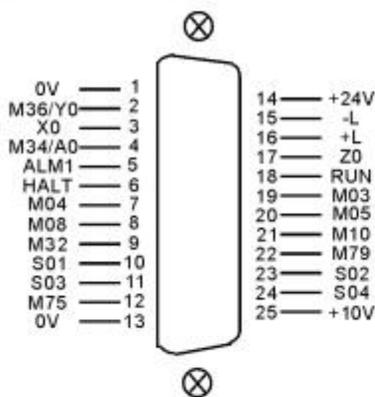
CN3 I/O1 signal with Female Socket of DB25				
signal	pin	I/O	function	Valid
0V	1	OUT	0V	0V
+24V	14	OUT	+24V	+24V
M36/Y0	2	IN	M36/Zero Point of Y-axis	0V
X0	3	IN	Zero Point of X-axis	0V
Z0	17	IN	Zero Point of Z-axis	0V
-L	15	IN	Positive limit	0V
+L	16	IN	Negative limit	0V
M34/A0	4	IN	M34/Zero Point of A-axis	0V
ALM1	5	IN	Alarm1 of Spindle	0V
HALT	6	IN	Pause	0V
RUN	18	IN	Run	0V
M03	19	OUT	Clockwise Rotation of Spindle	0V
M04	7	OUT	Counter clockwise Rotation of Spindle	0V
M05	20	OUT	Stop of Spindle	0V
M08	8	OUT	Coolant	0V
M10	21	OUT	Chuck	0V
M32	9	OUT	Lubrication	0V
M79	22	OUT	Thumbstall/Tailstock	0V
S01	10	OUT	Spindle first gear	0V
S02	23	OUT	Spindle second gear	0V
S03	11	OUT	Spindle third gear	0V
S04	24	OUT	Spindle fourth gear	0V
M75	12	OUT	Shift Control mode for C-axis	0V
+10V	25	OUT	Analog Output Signal of 1st spindle	0～10V
0V	13	OUT	Ground of frequency conversion	0V

Note: when your cnc system isn't configured with Y(C)-axis & A-axis,M36/Y0 & M34/A0 could be used as input point,controlled by M36/M34 code.

3.4.4 CN10 IO2 Socket (Female/DB25)
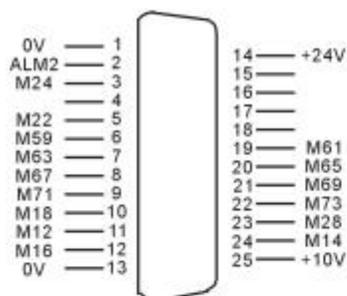
CN10 I/O2 signal with Female Socket of DB25				
Signal	Pin	I/O	Function	Valid
0V	1	OUT	Ground of the power supply	0V
+24V	14	OUT	24V power supply	+24V
ALM2	2	IN	Alarm2 of Machine Tool	0V
M24	3	IN	User-defined input 7	0V
M22	5	IN	M01 Quasi-stop Input	0V
M59	6	OUT	Huff Output	0V
M61	19	OUT	User-defined output1	0V
M63	7	OUT	User-defined output2	0V
M65	20	OUT	User-defined output3	0V
M67	8	OUT	User-defined output4	0V
M69	21	OUT	User-defined output5	0V
M71	9	OUT	User-defined output6	0V
M73	22	OUT	User-defined output7	0V
M18	10	IN	User-defined input1	0V
M28	23	IN	User-defined input2	0V
M12	11	IN	User-defined input3	0V
M14	24	IN	User-defined input4	0V
M16	12	IN	User-defined input5	0V
+10V	25	OUT	Analog Voltage Output of 2nd Spindle	0~10V
0V	13	OUT	Ground of frequency conversion	0V

3.4.5 CN16 IO3 Socket (Female/DB26)

```
X40 ——— 1      ⊗      14 ——— Y27
X41 ——— 2             15 ——— Y28
X42 ——— 3             16 ——— Y29
X43 ——— 4             17 ——— Y30
X44 ——— 5             18 ——— Y31
X45 ——— 6             19 ——— +24V
X46 ——— 7             20 ——— 0V
X47 ——— 8             21 ——— 0V
        9             22
+24V ——10             23 ——— HALT
Y24 ——11             24 ——— RUN
Y25 ——12             25
Y26 ——13      ⊗      26
```
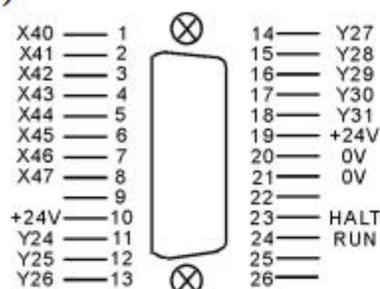
CN16 I/O3 signal with Female Socket of DB25				
Signal	Pin	I/O	Function	Valid
0V	20 , 21	OUT	0V	0V
+24V	10 , 19	OUT	+24V	+24V
X40	1	IN	Alternate input 0	0V
X41	2	IN	Alternate input 1	0V
X42	3	IN	Alternate input 2	0V
X43	4	IN	Alternate input 3	0V
X44	5	IN	Alternate input 4	0V
X45	6	IN	Alternate input 5	0V
X46	7	IN	Alternate input 6	0V
X47	8	IN	Alternate input 7	0V
Y24	11	OUT	Alternate output 0	0V
Y25	12	OUT	Alternate output 1	0V
Y26	13	OUT	Alternate output 2	0V
Y27	14	OUT	Alternate output 3	0V
Y28	15	OUT	Alternate output 4	0V
Y29	16	OUT	Alternate output 5	0V
Y30	17	OUT	Alternate output 6	0V
Y31	18	OUT	Alternate output 7	0V
RUN	24	IN	External Input for Run	0V
HALT	23	IN	External Input for Halt	0V

Note: 1. Y24 is controlled by K1 key on opertional panel.

2. Y25 is controlled by K2 key on opertional panel.

3. Y26 is controlled by K3 key on opertional panel.

3.4.6 CN5 XYZ Drive Socket (Male/DB25)

```
        0V ———13           25 —— YZO-
       ALM ———12           24 —— YZO+
      +24V ———11           23 —— 0V
      INTH ———10           22
     YDIR+ ——— 9           21 —— YDIR-
      YCP+ ——— 8           20 —— YCP-
     XDIR+ ——— 7           19 —— XDIR-
      XCP+ ——— 6           18 —— XCP-
      XZO+ ——— 5           17 —— XZO-
     ZDIR+ ——— 4           16 —— ZDIR-
      ZCP+ ——— 3           15 —— ZCP-
      ZZO+ ——— 2           14 —— ZZO-
            ——— 1
```
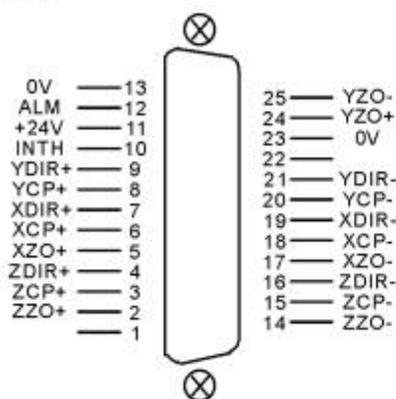
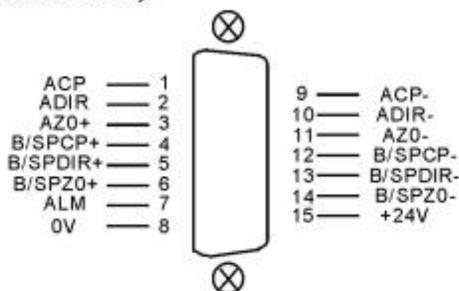| CN5 XYZ Driver with Male Socket of DB25				
Signal	Pin	I/O	Function	Valid
XCP+	6	OUT	Positive Pulse signal of X-axis	5V
XCP-	18	OUT	Negative Pulse signal of X-axis	
XDIR+	7	OUT	Positive Direction signal of X-axis	5V
XDIR-	19	OUT	Negative Direction signal of X-axis	
YCP+	8	OUT	Positive Pulse signal of Y-axis	5V
YCP-	20	OUT	Negative Pulse signal of Y-axis	
YDIR+	9	OUT	Positive Pulse signal of Y-axis	5V
YDIR-	21	OUT	Negative Pulse signal of Y-axis	
XZO+	5	IN	Positive Zero position signal of X-axis	5V
XZO-	17	IN	Negative Zero position signal of X-axis	
ZCP+	3	OUT	Positive Pulse signal of Z-axis	5V
ZCP-	15	OUT	Negative Pulse signal of Z-axis	
ZDIR+	4	OUT	Positive Direction signal of Z-axis	5V
ZDIR-	16	OUT	Negative Direction signal of Z-axis	
ZZO+	2	IN	Positive Zero Position signal of Z-axis	5V
ZZO-	14	IN	Negative Zero Position signal of Z-axis	
YZ0+	24	IN	Positive Zero Position signal of Y-axis	5V
YZ0-	25	IN	Negative Zero Position signal of Y-axis	
0V	13 , 23	OUT	0V	5V
ALM	12	IN	Alarm signal of Servo driver	
+24V	11	OUT	+24V of Power Supply	0V
INTH	10	OUT	Reset alarm signal	0V

Note: 1. The signal cables must adopt shielded twisted pair cable, the length is 20m at most.

    2. Whether the alarm signal ALM is normal open or normal close is set by P17 in Other parameter.

   *3. Control signals for Y-axis also is same to control signals for C axis.*

    4. When system take C axis to as rotate axis, M800 instruction is for backing to zero position of encoder, Output M75 signal to select position control mode of spindle servo, M03/M04 is to close M75 signal, spindle servo shift to speed control mode.

3.4.7 CN6 AB Drive Socket (Male/DB15)

CN6 AB Driver with Male Socket of DB15				
Signal	Pin	I/O	Function	Valid
ACP+	1	OUT	Positive Pulse signal of A-axis	5V
ACP-	9	OUT	Negative Pulse signal of A-axis	
ADIR+	2	OUT	Positive Direction signal of A-axis	5V
ADIR-	10	OUT	Negative Direction signal of A-axis	
BCP+	4	OUT	Positive Pulse signal of B-axis	5V
BCP-	12	OUT	Negative Pulse signal of B-axis	
BDIR+	5	OUT	Positive Pulse signal of B-axis	5V
BDIR-	13	OUT	Negative Pulse signal of B-axis	
AZO+	3	IN	Positive Zero position signal of A-axis	5V
AZO-	11	IN	Negative Zero position signal of A-axis	
BZO+	6	IN	Positive Zero position signal of B-axis	5V
BZO-	14	IN	Negative Zero position signal of B-axis	
0V	8	OUT	0V	0V
ALM	7	IN	Alarm signal of Servo driver	0V
+24V	15	OUT	+24V of Power Supply	24V

Example: Wiring Diagram[CNC Controller with dual servo drive(SZGH-302)]
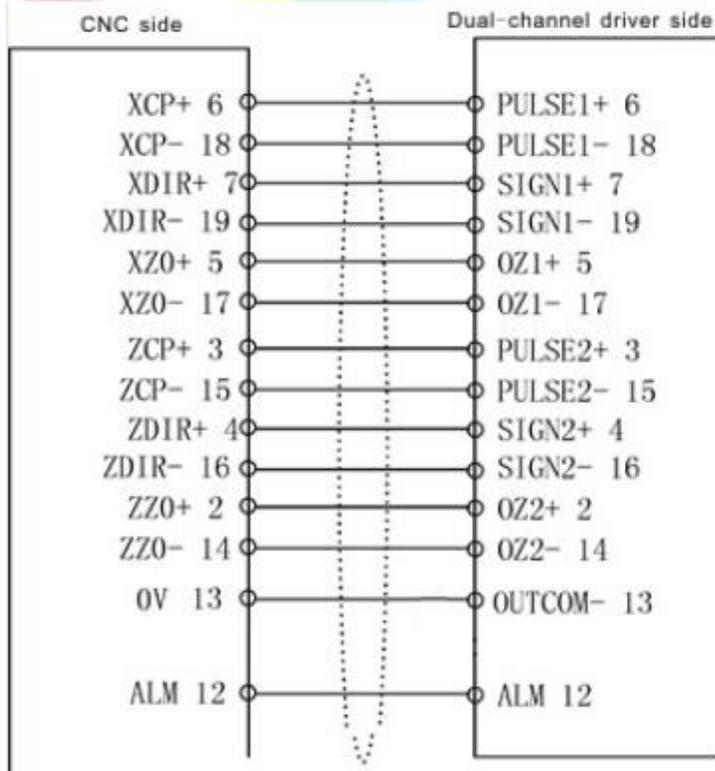
3.4.8 CN11 MPG/Handheld Box Socket (Male/DB15)
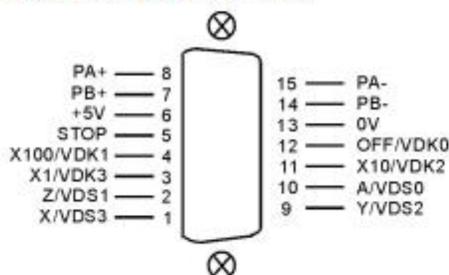
		CN11	Handwheel Signal with Male Socket of DB15	
signal	pin	I/O	function	Availability
0V	13	OUT	0V	0V
+5V	6	OUT	+5V	+5V
PA+	8	IN	A signal +	5V
PA-	15	IN	A signal -	
PB+	7	IN	B signal +	5V
PB-	14	IN	B signal -	
STOP	5	IN	emergency stop	0V
OFF/VDK0	12	IN	Off/ feed amending 0	0V
X100/VDK1	4	IN	*100/ feed amending 1	0V
X10/VDK2	11	IN	*10/ feed amending 2	0V
X1/VDK3	3	IN	*1/ feed amending 3	0V
A/VDS0/HALT	10	IN	A/SP amending 0/halt stop	0V
Z/VDS1	2	IN	Z/SP amending 1	0V
Y/VDS2/RUN	9	IN	Y/SP amending 2/run	0V
X/VDS3	1	IN	X/SP amending 3	0V

3.4.8.1 Electrical handwheel (Manual pulse generator)

Handwheel contact diagrammatic as:
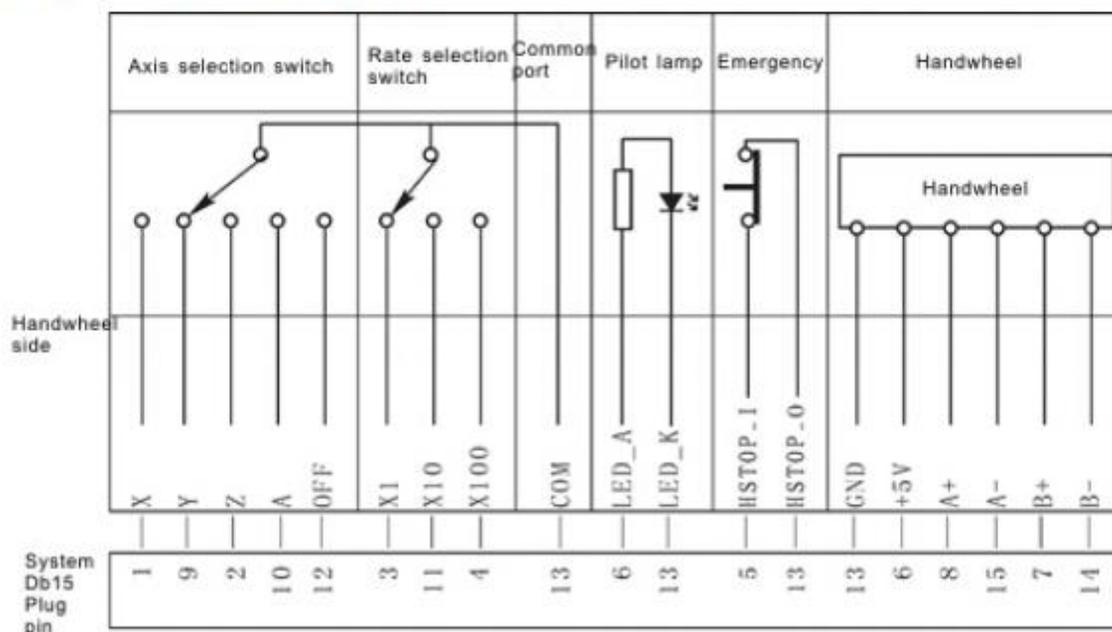
When user connect our handheld box to CN11 Plug, P1 in Other parameter needs to set 1,

and cannot use band switch to adjust SP_Rate, Feed_Rate & External Run/Pause, and P1&P2 in Axis parameter only could be "0". X Y Z A X1 X10 X100 inputs are for axis-selection & rate, P33&P34 in Other parameter only could set to 0.

PA+ PB- PA+ PA- are corresponding input signal of handwheel pulse A B.

The input signal of handwheel:
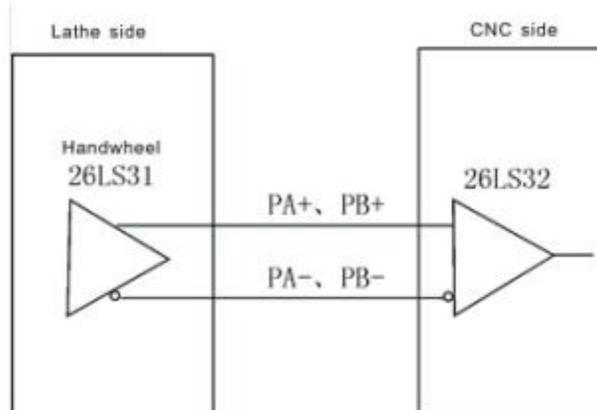
Attention:

1. The output signal of handwheel adopts line output, the power supply is +5V.

2. Just connect PA+ PB+ if adopt voltage output.

3. Manual pulse generator needn't switch button for Enter ON/OFF handwheel, if there is a switch for Enter, it is okay that use short connection of switch.

3.4.8.2 Using for Band Switch

When P1 & P2 in Axis parameter is set to "1", VDK0/VDK1/VDK2/VDK3 & VDS0/VDS1/VDS2/VDS3 are working, which can't as inputs for external Run/Halt button, P1 in Other parameter is 0; P33&P34 in Other parameter only set to be 0.

VDS0(A) VDS1(Z) VDS2(Y) VDS3(X) are the input signal of adjust rate of spindle, total 16 gears. VDK0(OFF) VDK1(X100) VDK2(X10) VDK3(X1) are inputs signal of adjust Rate of Feeding speed, total 16 gears.

3.4.8.3 External Switch for Run/Halt

When P33 in Other parameter is "1", PIN9 of CN11 plug can be as input for external Run, which running program automatically; When P34 in Other parameter is set to "1", PIN10 of CN11 plug can be as input for external Halt, which pause processing program.

3.4.8.4 Using for Eexternal Emergency Stop

STOP signal is the input signal of external emergency button, P27 in Other parameter is set for type of switch of emergency stop button. 0: NO type, 1: NC type.

3.4.9 CN13 Position Feedback Socket(Male/DB26)

```
Y_B+  13   ⊗   26  +24V
A_A+  12       25  DX+
A_B+  11       24  DX-
 0V   10       23   0V
+5V    9       22  B_A+
X_A-   8       21  B_A-
X_B-   7       20  B_B+
Z_A-   6       19  B_B-
Z_B-   5       18  X_A+
Y_A-   4       17  X_B+
Y_B-   3       16  Z_A+
A_A-   2       15  Z_B+
A_B-   1   ⊗   14  Y_A+
```
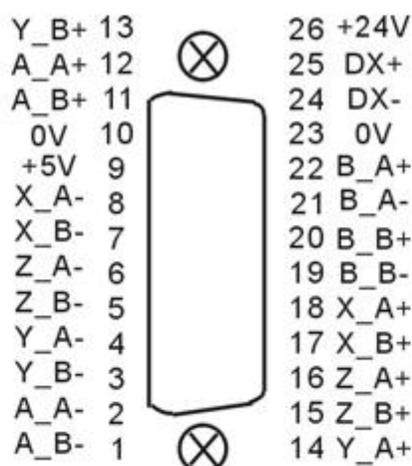
CN13 Position Feedback with DB26 Male Socket
Signal	Pin	I/O	Function	Valid
0V	10,23	OUT	Ground of power supply	0V
+5V	9	OUT	5V power supply	+5V
+24V	26	OUT	24V power supply	+24V
DX+	25		RS485+	
DX-	24		RS485-	
XA+	18	IN	Positive signal A of X axis	5V
XA-	8	IN	Negative signal A of X axis	
XB+	17	IN	Positive signal B of X axis	5V
XB-	7	IN	Negative signal B of X axis	
YA+	14	IN	Positive signal A of Y axis	5V
YA-	4	IN	Negative signal A of Y axis	
YB+	13	IN	Positive signal B of Y axis	5V
YB-	3	IN	Negative signal B of Y axis	
ZA+	16	IN	Positive signal A of Z axis	5V
ZA-	6	IN	Negative signal A of Z axis	
ZB+	15	IN	Positive signal B of Z axis	5V
ZB-	5	IN	Negative signal B of Z axis	
AA+	12	IN	Positive signal A of A axis	5V
AA-	2	IN	Negative signal A of A axis	
AB+	11	IN	Positive signal B of A axis	5V
AB-	1	IN	Negative signal B of A axis	
BA+	22	IN	Positive signal A of B axis	5V
BA-	21	IN	Negative signal A of B axis	
BB+	20	IN	Positive signal B of B axis	5V
BB-	19	IN	Negative signal B of B axis	

P200-P220 in Other parameter set the function. Press "G" in Diagnosis to clear the instruction position and feedback position and clear the deviation alarm after alarm.

Attention: 1, The encoder or the grating output signal with long-line output mode (also RS422), the power supply is +5V.

2, The signal line must adopt shielded twisted pair cable, the length shall not exceed 20m.

3.5 I/O Electrical Board
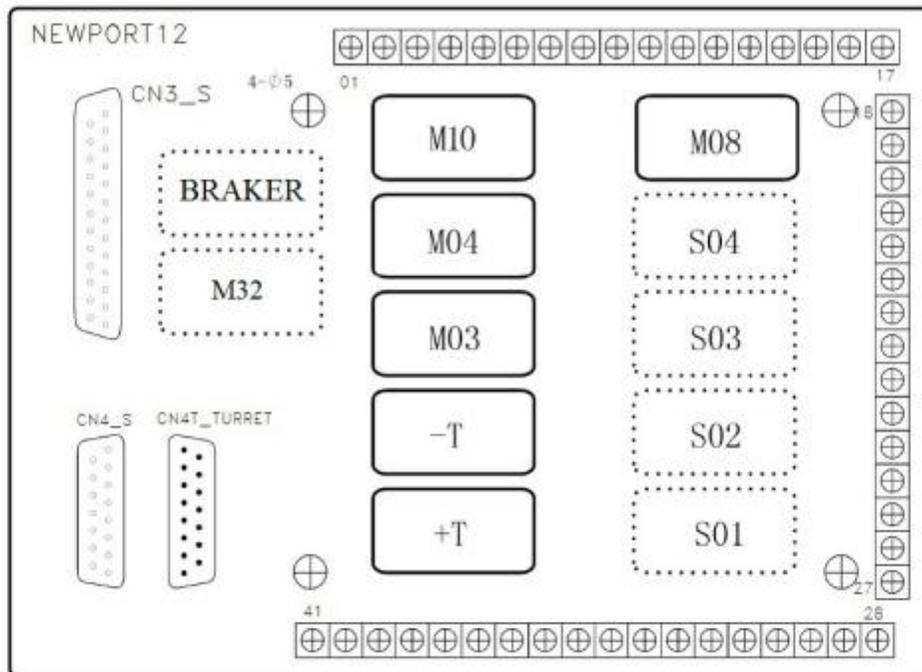
I/O electrical board is optional item,which is used for connecting system and load easily.

CN3_S socket is corresponding to CN3 port of system one by one;

CN4_S socket is corresponding CN4 port of system one by one;

CN4T is connected to position signal of turret and supply power to encoder of turret, 1-T1, 2-T2, 3-T3, 4-T4, 5-T5, 6-T6, 7-T7, 8-T8, 9-0V, 10-power supply +24V, 14-T0K.

3.5.1 Control of Turret

+T, -T must be connected to external AC contactor.

C3 is common port of +T, -T and M08.

3.5.2 Control of Spindle

C1 is the common port of M03 and M04.

C2 is the common port of M10, M10B is normal close.

3.5.3 Control of Spindle Gear

C4 is the common port of S1 and S2, S1B and S2B are normal close.

C5 is the common port of S3 and S4, S3B and S4B are normal close.

3.5.4 Define of IO ports

PIN_I/O	Mark	Function
1	BRK_+B	Connected to Braker of motor
2	BRK_+V	Connected to Braker of motor
3	DS301_24	Connected to PIN24 of driver
4	0V_22	Connected to PIN22 of driver

PIN24 & PIN22 of SZGH series Servo Driver are connected to PIN3(DS301_24) & PIN3 (0V_22) of IO control board directly, which is for controlling BRAKER relay, output ports are BRK_+B & BRK_+V, NC type switch output.

5	+24V	Supply 24V power
6	-L	Limit in negative direction of all axes
7	+L	Limit in positive direction of all axes
8	M79	P22_CN3,Output directly
9	M75	P12_CN3,Output directly
10	M10	P21_CN3,Output directly
11	M05	P20_CN3,Output directly
12	M32K	P9_CN3, Output for Lubricate through relay
13	M32	
14	Z0	P17_CN3,Input directly
15	M34/A0	P4_CN3,Input directly
16	X0	P3_CN3,Input directly
17	M36/Y0	P2,Input directly

U	Connecting to power of turret,which is used for filter
V	
W	

18	S4B	Normal Close type
19	S4	Normal Open type
20	S3B	Normal Close type
21	S3	Normal Open type
22	C5	Common port of S3&S4
23	S2B	Normal Close type
24	S2	Normal Open type
25	S1B	Normal Close type
26	S1	Normal Open type
27	C4	Common port of S2&S1

28	COM	Common port for filter circuit
29	-T	Output CCW of Turret through relay
30	+T	Output CW of turret through relay
31	M8	P8_CN3,Output through relay
32	C3	Common port of turret&M08

33	M10	P21_CN3,Output through relay
34	C2	Common port of M10
35	M10B	Output,Normal closed type
36	M4	P7_CN3,Output through relay
37	M3	P19_CN3,Output through relay
38	C1	Common port of M3&M4
39	ALM1	P5_CN3,Input directly
40	+10V	P25_CN3,Output directly
41/42	0V	P13_CN3,Output directly

3.6 Daily Maintenance and Repair

In order to plenty use CNC system's function and promote efficiency, the most important work is correctly using system , and notice system's daily maintenance work , promote Mean Time Between Failures MTBF.Now this system's maintenance method is introduced as follows：

3.6.1 Maintain

System's using must be under the good circumstance.

Operator,programmer and repairer must be familiar with NC machining technology, and according the require of user book correctly use， do one's best to avoid improper operation.

Everyday operator should clean the system's box and panel in case for corrupt thing and sundries to damnify it.

When CNC system's using time is over three month,operator should open the system box and clean inside.

If not using system for long time,should boot the system one time every week.

3.6.2 Ordinary Problem

3.6.2.1 System can't boot

1）check if input power is normal.
2）check if power switch is turn on.
3）check insurance.

3.6.2.2 No display as boot

1）Boot again or reset.
2）Check if switch power's ＋5V、＋12V、−12V、-24V are normal.
3）Check if transformer is bad.
4）Check if LCD's bright adjust and connection are normal.
5）Check if main board is normal.

3.6.2.3 System's control disorganize

1）Wrong operations.
2）Anti-jamming ability of power supply is descend.
3）Working circumstance of CNC system is too bad.

3.6.2.4 Lose of user program

The DC battery on system main board can insure user's program and parameter don't lose.When system isn't used for half year or system has been used for over two years , the battery maybe invalidate,therefore, should exchange battery.

3.6.2.5 Machining precision is bad

1）CNC Machine needs to revise backlash after using some time.
2）Best to revise base point before machining in order to insure the start point's precision.
3）Machining speed and cutting depth is improper.
4）Machine connector's prick melt falls off.
5）Tool isn't tightened.
6）Piece clamp isn't good.
7）Tool's giving up isn't equality because piece's dimension isn't uniformity.
8）Problems of machine Tool

Attention: Because of many kinds of reasons this Manual book may have some mistakes. Our company will provide the high quality service and the technical support for every customer.

Appendix I Wiring Diagram of CN4 Turret
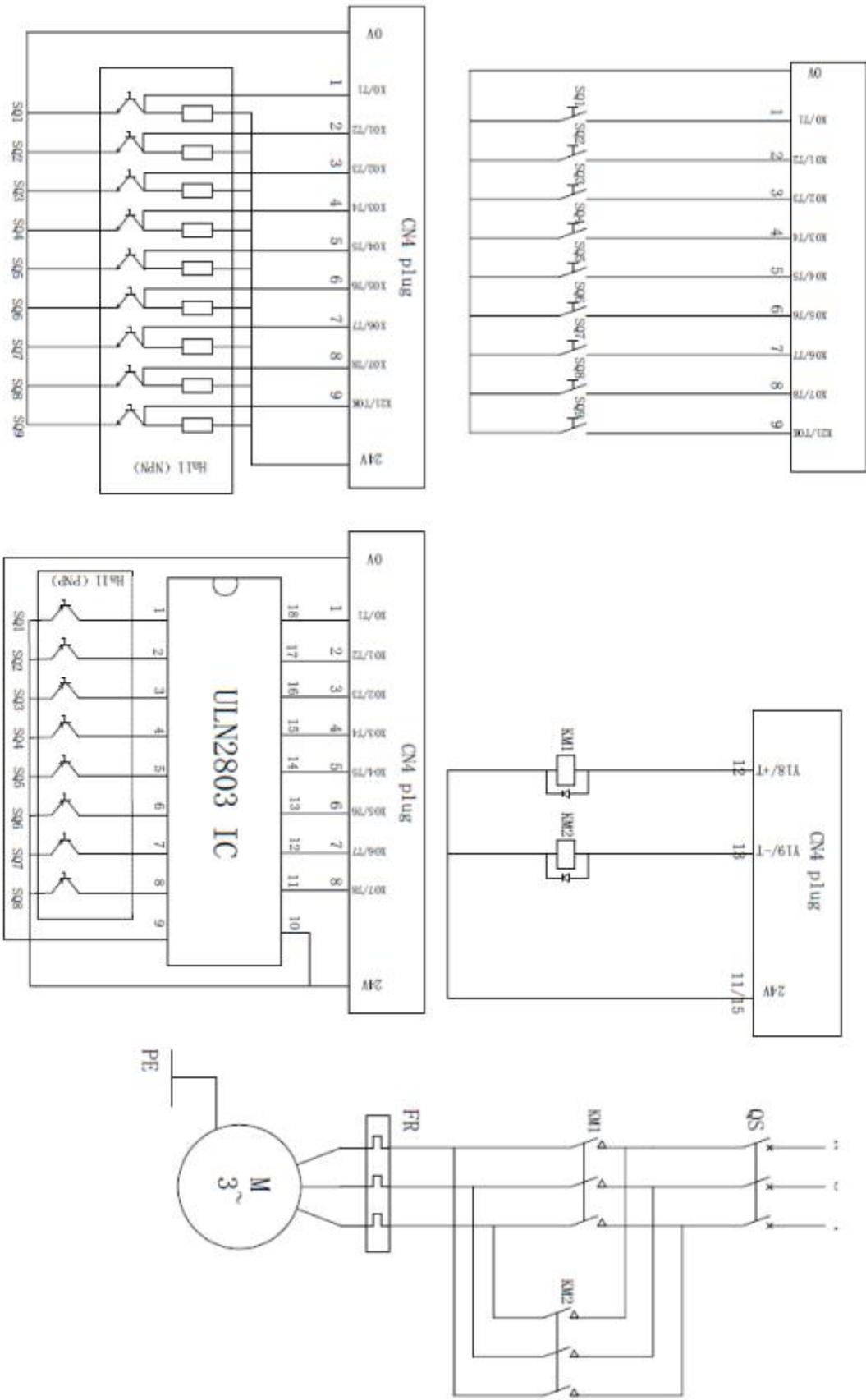
Appendix II   Wiring Diagram of CN3 Plug

Left label	Pin	Right signal
−24V	1	0V
X11 /Y(C)_HOME	2	M36 /Y0
X12 X_HOME	3	X0
X08 /A_HOME	4	M34 /A0
X23 ALARM_SP	5	ALM1
X15 PAUSE_PROG	6	HALT
Y13 CCW_SP	7	M04
Y11 COOLANT	8	M08
Y08 LURBRICATE	9	M32
Y23 1ST_GEAR_SP	10	S01
Y22 3RD_GEAR_SP	11	S03
Y15 C_CONTROL_MODE	12	M75
−24V	13	0V
+24V	14	24V
X09 NEGATIVE_LIMIT	15	−L
X10 POSITIVE_LIMIT	16	+L
X03 Z_HOME	17	Z0
X14 RUN_PROG	18	RUN
Y14 CW_SP	19	M03
Y12 STOP_SP	20	M05
Y10 CHUCK1	21	M10
Y09 TAILSTOCK	22	M79
Y22 2ND_GEAR_SP	23	S02
Y20 4TH_GEAR_SP	24	S04
1ST_ANALOG_SP	25	+10V

Appendix III   Wiring Diagram of CN10 Plug

Signal name	X/Y	Inner signal	Pin
-24V		0V	1
ALARM2_MACHINE	X24	ALM2	2
USER_INPUT7	X26	M24	3
			4
INPUT_M01_STOP	X27	M22	5
HUFF	Y07	M59 (24V)	6
USER_OUTPUT2	Y01	M63 (24V)	7
USER_OUTPUT4	Y03	M67 (24V)	8
USER_OUTPUT6	Y05	M71 (24V)	9
USER_INPUT1	X28	M18	10
USER_INPUT3	X29	M12	11
USER_INPUT5	X31	M16	12
-24V		0V	13
+24V		24V	14
			15
			16
			17
			18
USER_OUTPUT1	Y00	M61 (24V)	19
USER_OUTPUT3	Y02	M65 (24V)	20
USER_OUTPUT5	Y04	M69 (24V)	21
USER_OUTPUT7	Y06	M73 (24V)	22
USER_INPUT2	X25	M28	23
USER_INPUT4	X30	M14	24
2ND_ANALOG_SP		+10V	25

Appendix IV Operational Panel

A Type Opertioanl Panel

B Type Operational Panel(Default Configuration)

C Type Operational Panel

E Type Operational Panel

Note:SZGH-CNC1000TDb series cnc controller can be confiured with any type operational panel.