CH-CM0406
Cut-Prepoint-Chamfer Machine

Operation & Parts Manual

Machine Serial No. 202602-56

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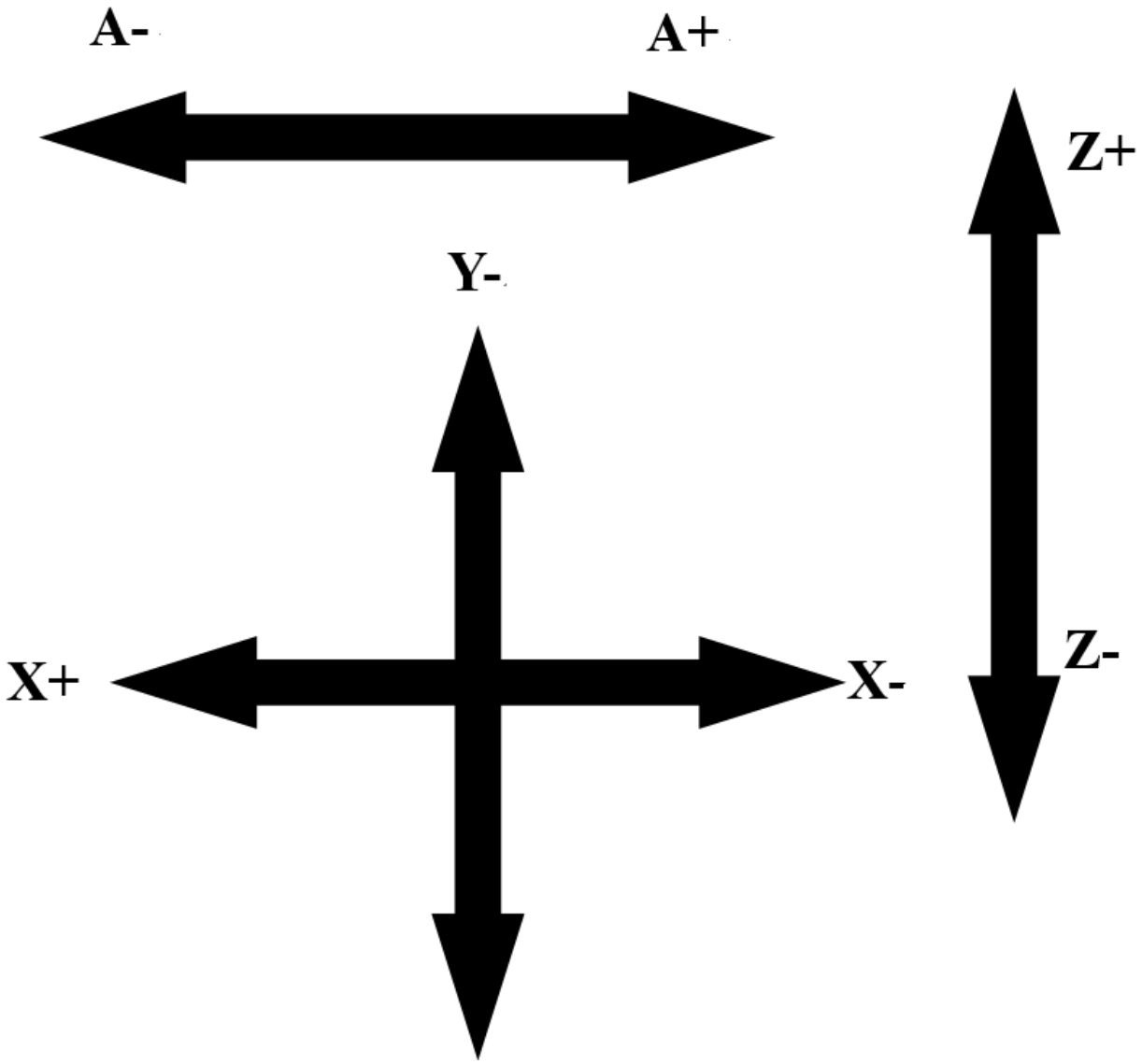
10. SAFETY RULES FOR ELECTRICAL CONTROL SYSTEM 150

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*Version 5 is to add the function of 2nd chamfering mode.
Amended axis direction.
English page's words amended.

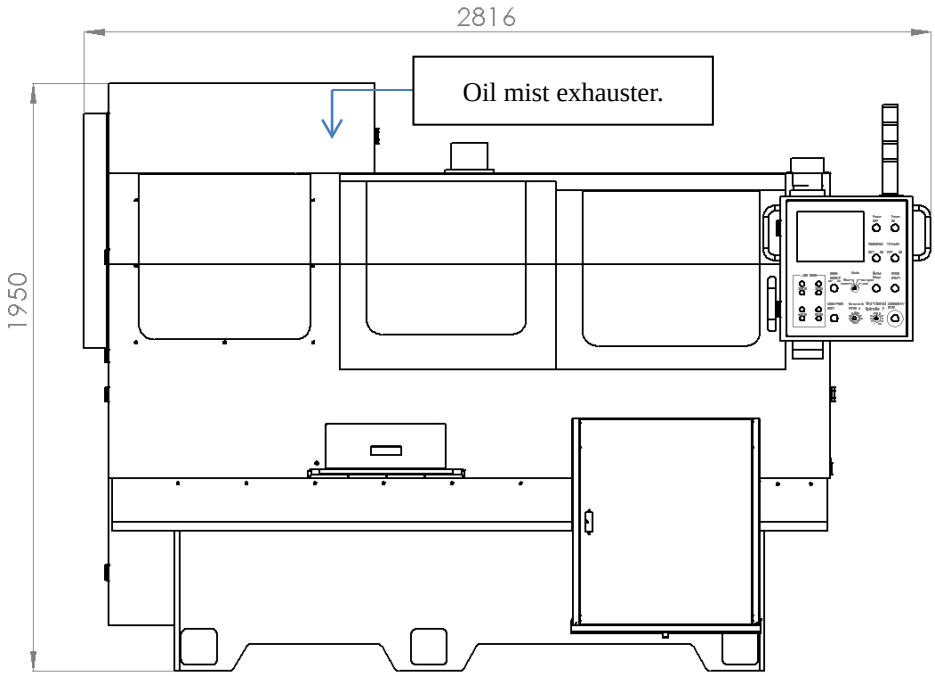
Product Descriptions

Definition of Axis

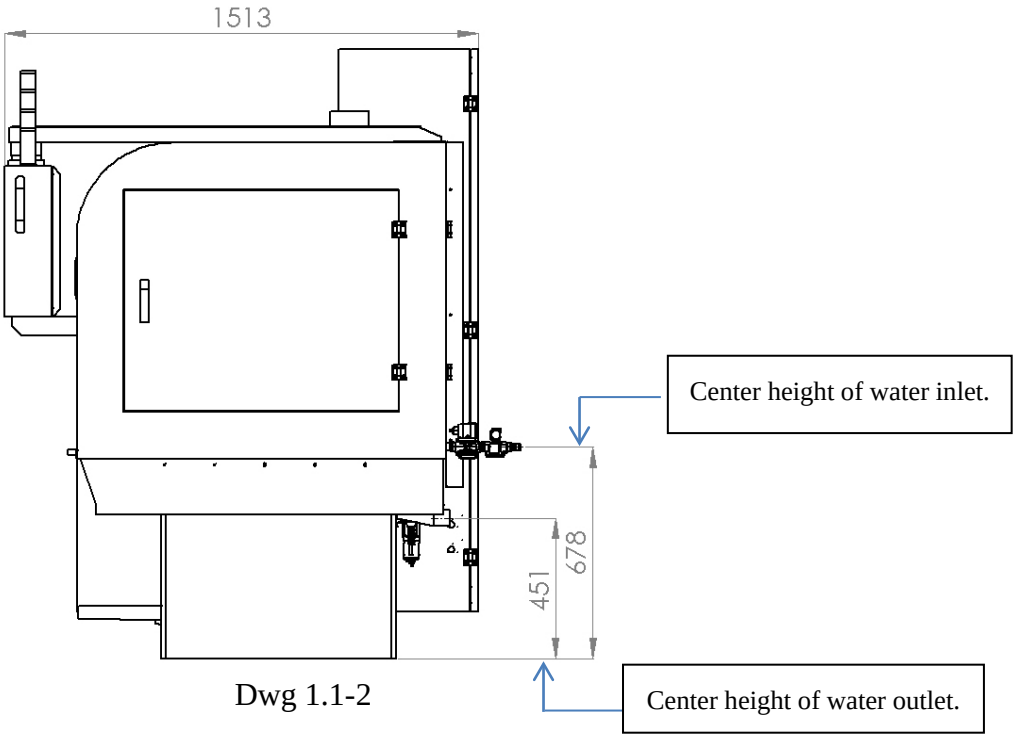


1. Machine exterior

1.1 Exterior Size

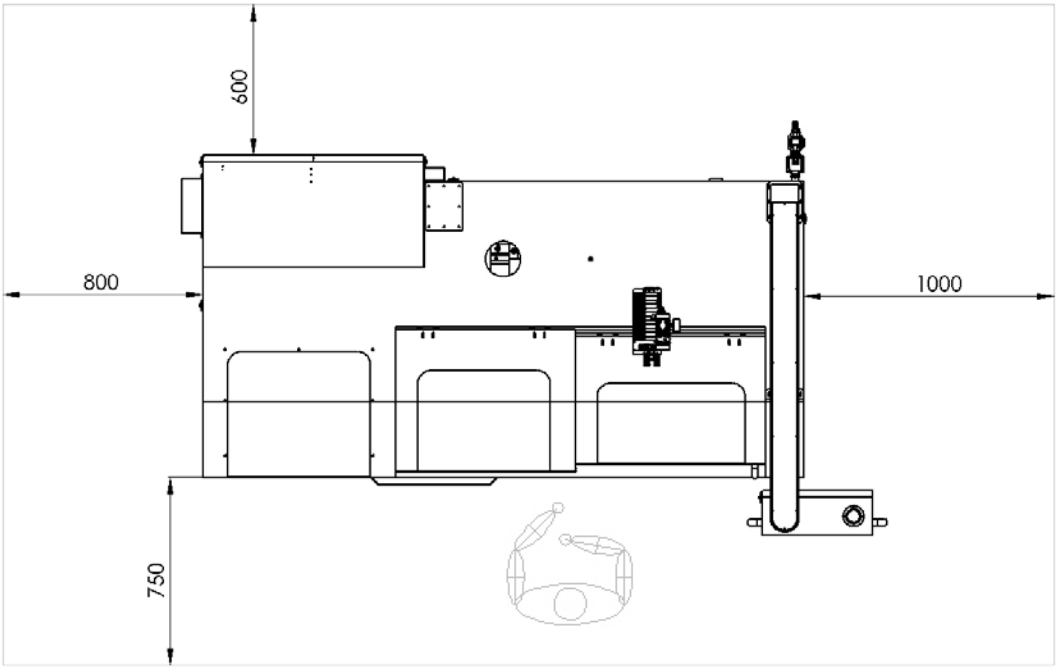


Dwg 1.1-1

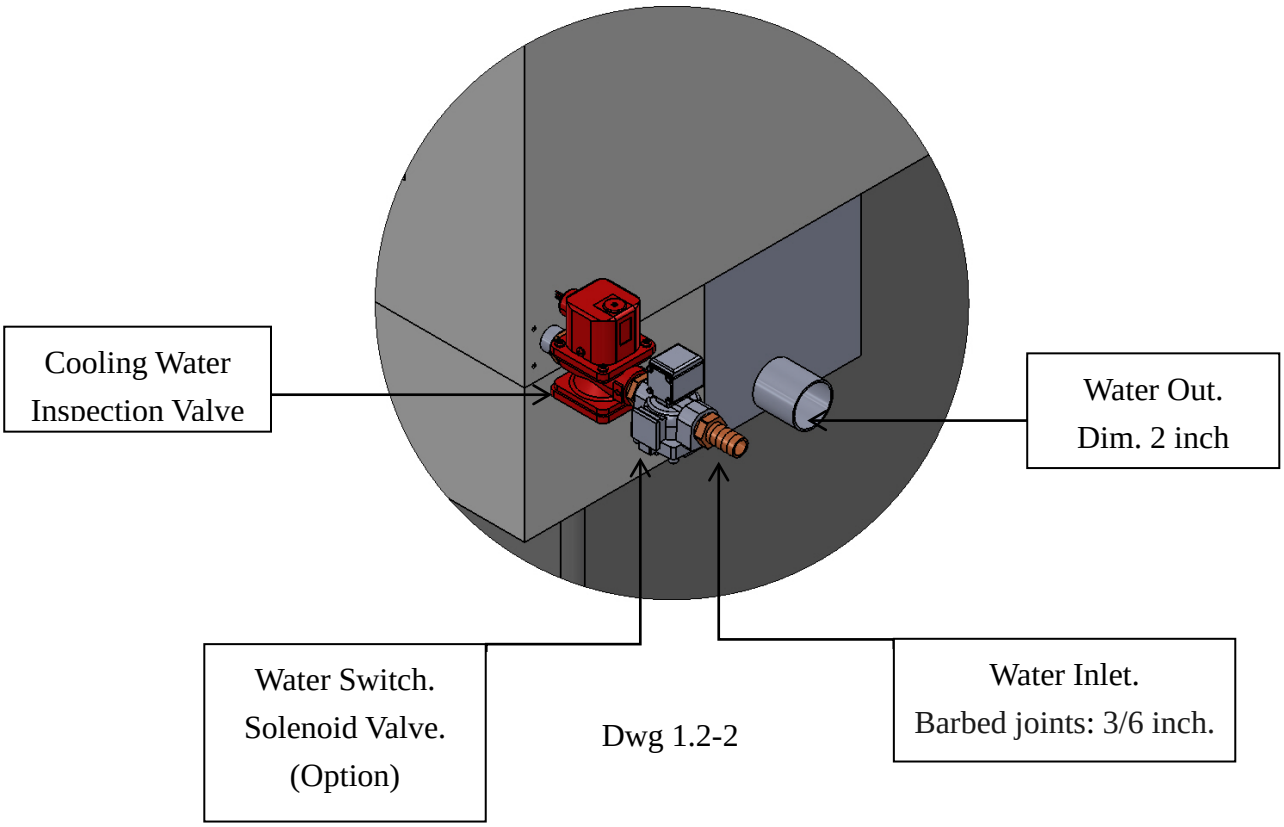


Dwg 1.1-2

1.2 Floor Layout



Dwg 1.2-1



Dwg 1.2-2

2. Installation

Full side of the machine can be touched, refer to dwg. 1.2-1 recommendation of space reserved layout.

Note: The size of tank and dust collector are need to be considered if purchased those items.

2.1 Base

SRCC must be stable installed on flat ground and fixed.

2.2 Environmental

Table 3.1 Environmental Situations

Highest humidity	70%
Room Temperature	18~22°C
Dust	Environment must be kept with cleanness equivalent to a clean room
Vibration	Shocks from strong vibrations may impact machine function and life
Electromagnetic field	Strong electromagnetic field (EMF) may interfere machine instructions

2.3 Specification

Table 3.2 Specification.

Aera	Europe	China	Taiwan
Input voltage	3Ø 400V AC	3Ø 380V AC	3Ø 220V AC
Frequency	50 Hz	50 Hz	60 Hz
Power consumption	KW	KW	KW
Current	A	A	A
Breaker capacity	30A	30A	50A
Wire size	8mm²	8mm²	14mm²
Pneumatic requirement			
Rated pressure	6.0 bar		
Humidity	Compressed air must be dried		
Compressed air cleanness	Compressed air must be filtered		
Compressed air consumption	50 L/min		
Other information			
Machine Dimensions	(L)2816mm* (W)1513mm* (H)1950mm		
Machine weight	2055 Kg		

2.4 Movement / Storage

*** Machine always up when delivery.**

*when machine is being moved, do not fall down or shake the machine and be aware of the center of gravity position.

*Use crane to move the machine.

*The minimum loading for crane is 4500kg.

*Observe the space while moving the machine.

*Center of the machine is on center of left side.

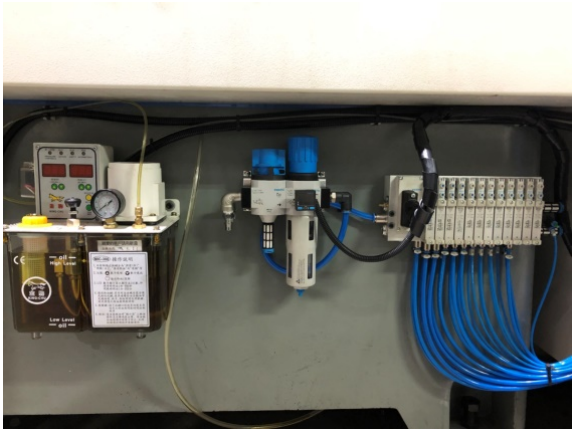
2.5Unboxing

1. Remove the protective film from the machine.
2. Only use lifter to move the machine to proper position.

2.6 Settle and Connection

SRCC must be stable settled on flat ground.

1. Use anchor screw to adjust the base level.
2. Install the air connection to the back side of machine. Pressure 6 bar. Refer to dwg. 2.6-1
3. Install electricity. (Qualified electrical engineer only.) 220V/50Hz/3Phase. Refer to dwg. 2.6-2
4. Remove the fixed board from the X axis and Y axis and tray.
5. Inspect moving table and relative mechanism.
6. Install cutting fluids and oil cycle pipes. Refer to dwg. 1. 1-2
7. Install exhaust fan and pipe. Refer to dwg.1. 1-1



Dwg. 2.6-1



Dwg. 2.6-2

3. Safety

3.1 Dangerous Area

SRCC provides safety device in order to protect operator.
Error and abused operate the machine would cause below risk:
Operator would be affected life and body got hurt.
Damage the machine or other property.
Effected the machine efficiency.
****The operator does every operation and maintaining must have:
Qualification
Read every operated instruct

3.2 Operating Safety

Any machine changed without permission is forbidden. It would affect the machine and human safety.
Every operation、service and maintaining are mentioned on this manual must be strictly observed.

3.3 Safety Equipment

Safety device operation on CMPG can’t be affected by extra installation.
Emergency button must be touchable.

3.4 Noise

The noise of CMPG on operating is under 70dB(A)。(Excluded option exhaust equipment.)
Noise value is based on ISO 7960

Value determination is according to ISO 3746 inspected regulations.
This reference graph is emission grade, which is not the requirement of safety working grade. When specifying the grade and exposed grade and have the relationship, do not use this table to judge it, it should be in addition another safety measure.
The real effective of exposure level factor is included continue noise period. (The quantity of machine in working area.)
The exposure grade is according each country’s rule; this information would make a better dangerous evaluation to the operator.

3.5 Caution

- SRCC used high precision grinding spindle. The maximum speed can be reached to 4000 RPM.it would be caused broken or friction if any parts is interfered.
- CMPG maximum speed of workpiece spindle can be reached to 400RPM (limited turn round). It would be caused broken or friction if any parts is interfered.
- It would be shooting out the broken parts or particle to harm un-protected eyes.
- Please do stop the machine before doing maintaining or cleaning.

3.6 Working Area

Working area is in front of machine and able to see HMI interface.

 **When machine is running, do not stand or lean against the machine or electric box.**

3.7 Qualified Operator

*Only qualified operator can operate the SRCC.

*The operated responsibility must be specified and restricted clearly. It would cause risk if it's not clearly understood the operation to SRCC.

*User responsibility:

Assigned a person in charge of SRCC.

Make sure the operator, who is in charge, read operated manual carefully and understand how to use SRCC.

3.8 Personal Protected Equipment

When machine is running or open the safety door, please do wear safety goggles to prevent from practical or small parts shooting out and harm the eyes.

3.9 Installed Place of Safety Measure

SRCC must be stably placed on flat ground.

**Note:

It must be always clear and opened space at working area.

3.10 Safety Device

SRCC stop operated by below switches.

- Emergency Stop
- Main Power

Check Internal Machine

- Restart to turn on the machine. (Interrupt the operation)
- After each maintaining or repairing.

3.11 Safety Mark

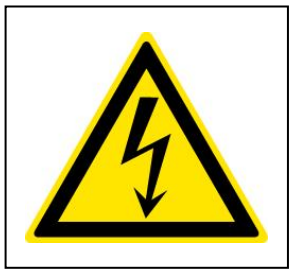
*All the safety warning signs indicate correct and safety operation.

*All the safety sign on the machine is to indicate that might have high risk operation or position.

*Do not remove the safety sign on the machine.

*All the safety warning sign is stocked in proper place on the machine.

*Make sure all signs clearly, if any lose or broken, it must be made up immediately



Electric shock



Rolling, Keep hands away

3.12 Name Plate



Dwg. 3.2 Name Plate

3.13 Emergency

Emergency Switch: Press “Emergency Stop” when any emergency condition happening.

All the functions and operations will be stopped immediately when press the emergency switch or safety function started.

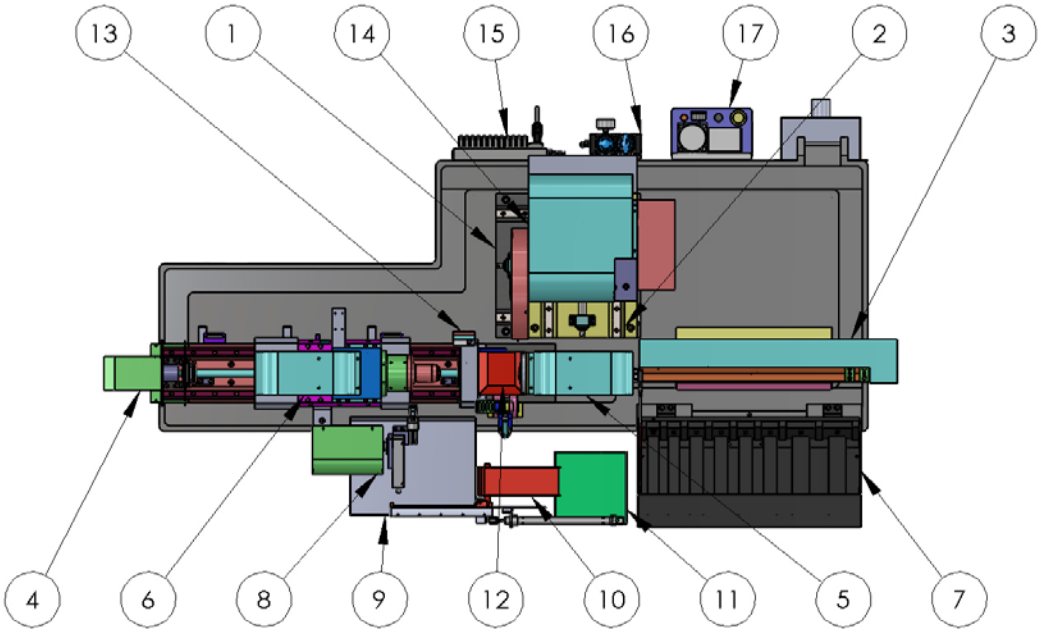


Dwg. 2.3 Emergency Stop

4. Main Components

Operator must be read and understood operation instruction.
Before reading this operation manual, do not operate the machine.
The main components of SRCC must be familiar with function and definition.

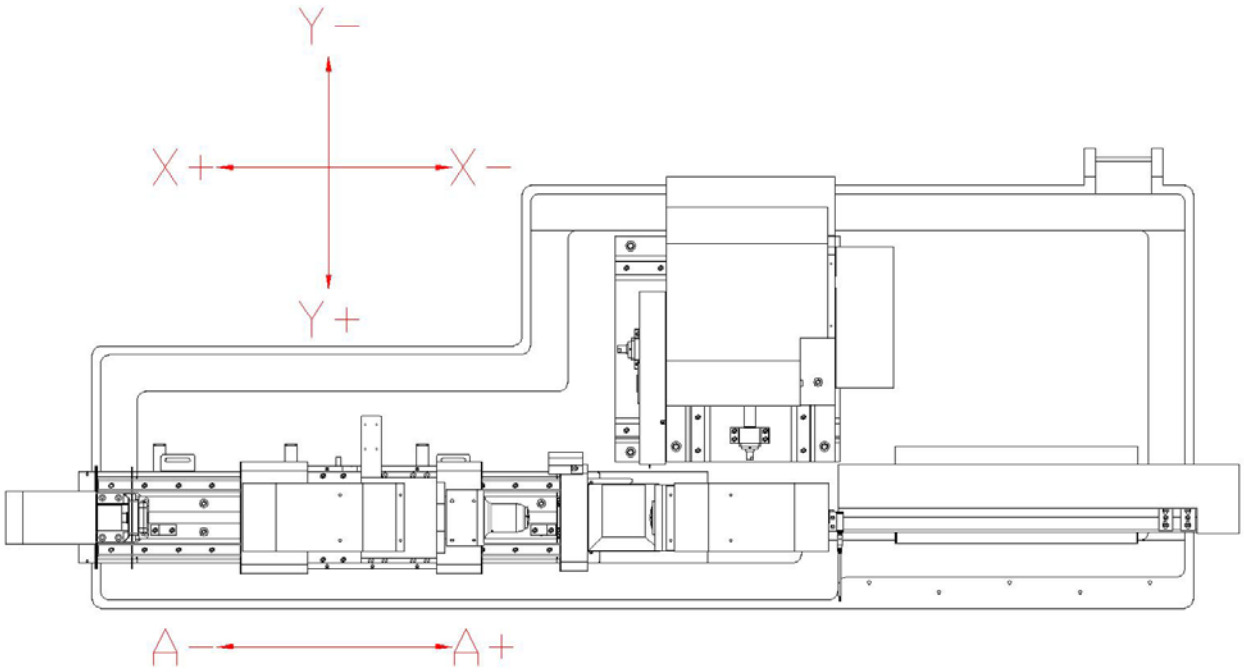
4.1 Mechanism



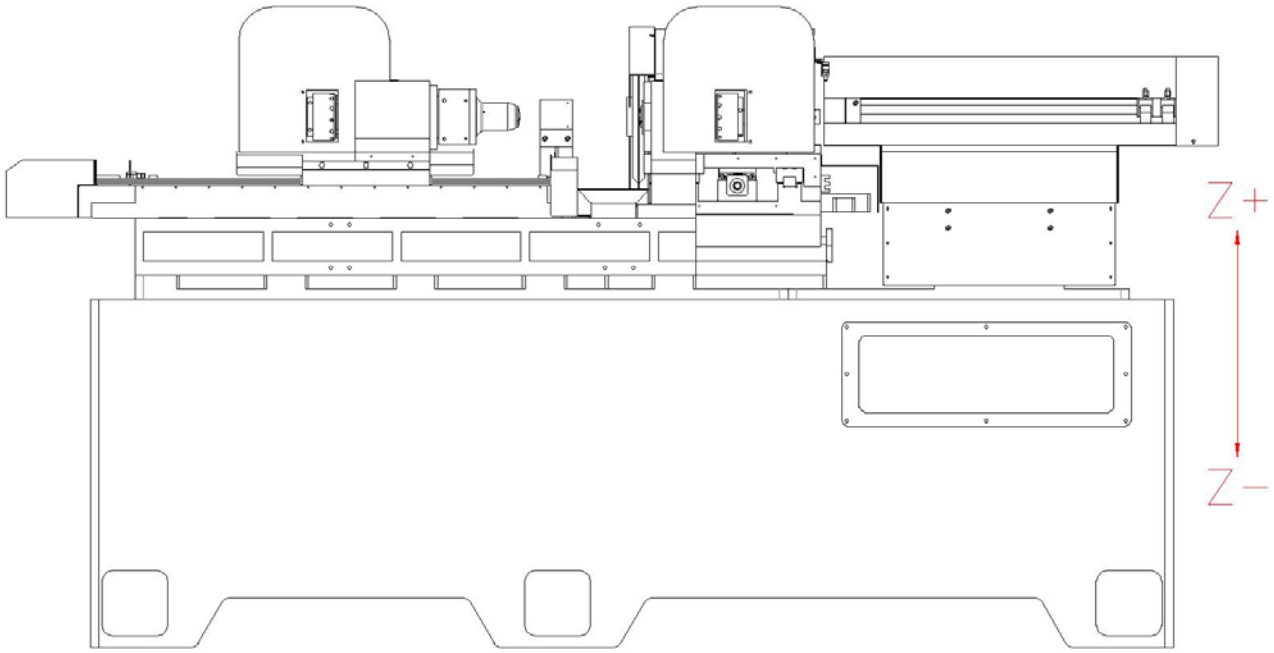
Dwg 4.1-1

1. X Axis
2. Y Axis
3. Z Axis –Pusher mechanism.
4. A Axis
5. B Axis
6. C Axis
7. Loading mechanism.
8. Unloading mechanism.
9. Material box.
10. Scrap outlet mechanism.
11. Scrap plate.
12. Scrap plate.
13. Wheel inspected sensor mechanism.
14. Wheel axis mechanism.
15. Solenoid Valve.
16. Air conditioning unit.
17. Lubricator.

4.2 Axis Diagram



Dwg. 4.2-1



Dwg 4.2-2

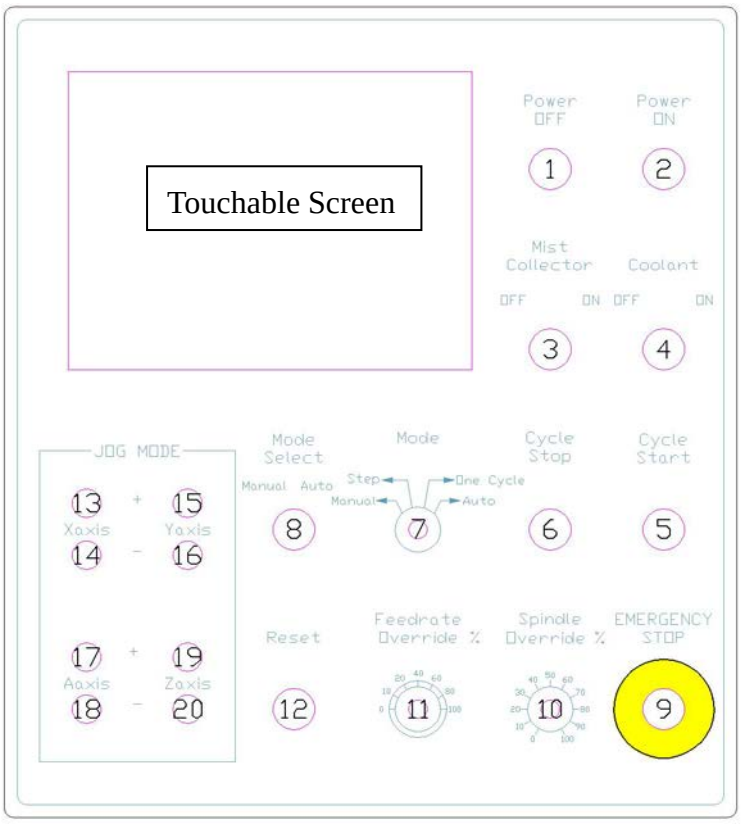
4.3 HMI Control Panel and Button

4.3-1 HMI Introduction and Operation.

*HMI is touchable of human machine interface, which connected between operator and SRCC. Also, it can be used the finger or blunt plastics item to touch it.

*HMI interface is to process the parameter changing of grinding producer and driving each actuator in single action or auto/single process.

1. Power OFF
2. Power ON
3. Mist Collector ON/OFF.
4. Coolant ON/OFF.
5. Cycle Start.
6. Cycle Stop.
7. Mode (Step/Manual/One Cycle/Auto)
8. Mode Select (Manual/Auto)
9. Emergency Stop.
10. The button of Spindle Override. (%)
11. The button of Feedrate Override. (%)
12. Reset
13. Jog Mode X axis + movement.
14. Jog Mode X axis - movement.
15. Jog Mode Y axis + movement.
16. Jog Mode Y axis – movement.
17. Jog Mode A axis + movement.
18. Jog Mode A axis – movement.
19. Jog Mode Z axis + movement.
20. Jog Mode Z axis – movement.



Dwg.4.3-1

4.4 Hand Wheel

1. F1- Release right collet.
2. F2- Release left collet.
3. F3- The action of Z Axis cylinder.
4. F4- The action of loading stopper.
5. F5- The action of unloading rotary cylinder.
6. F6- The action of unlading arm cylinder.
7. X X axis movement.
8. Y Y axis movement.
9. Z Z axis movement.
10. 4 A axis movement.
11. 5 B axis movement.
12. 6 C axis movement.
13. A-1 / A-2 HW action button (both pressed)



Dwg. 4.4-1

4.5 Electric Lubricator and Oil Cycle

Electric lubricator

Electric lubricator is on when machine is on (power on)

When lubricating oil is under lower limited, machine will alarm the warning.

Oil box capacity: 4 L

Oil pressure: MAX 7 bar

Lubricating time: Min 4 SEC(up LED value，unit: Sec)

Break time: Max. 50 min (down LED value，unit: Min)

Oil Type：R68

Operating instruction:

Oil pressure: the rotary screw on front side of lubricating device can adjust oil pressure (collocate oil button), oil pressure is working when doing lubricating. The pressure of break time is set 0 to provide the oil, which means when break time button is pressured, then lubricating device will be working.

Set/Start: This is the function of setting lubricating / break time. 1st time pressing this button to change the parameter, 2nd time pressing is to finish the setting and start provide the oil. While setting, the LED value can be adjusted by pressing adjusting button. (0→ 9 cycle), also, changing value, the LED will be blinked. Lubricating time can be set 0~999 sec. Break time can be set 0~999 min.

Oil cycle tank

Everyday needs to release the oil on the tank to prevent from oil overflow and contaminate the ground.

To observe oil cycle condition to check the lubricating device and pipes are normal.



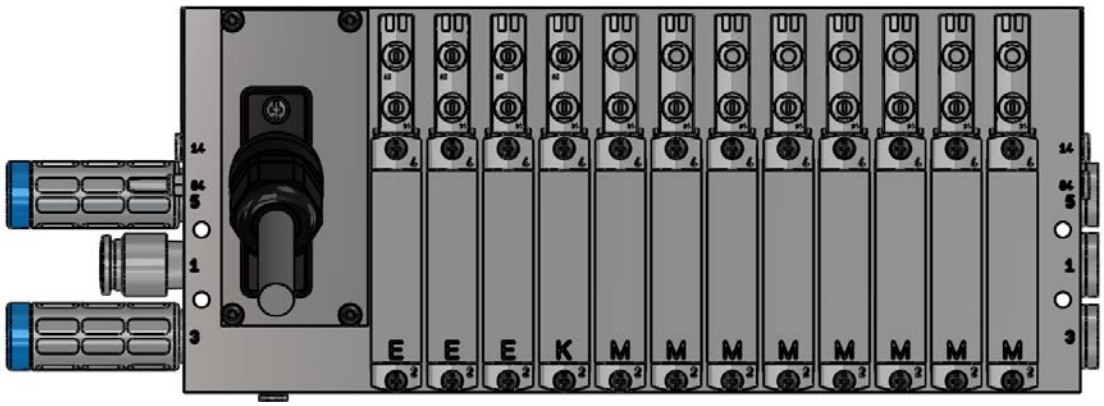
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4.6 Air Pressure Unit

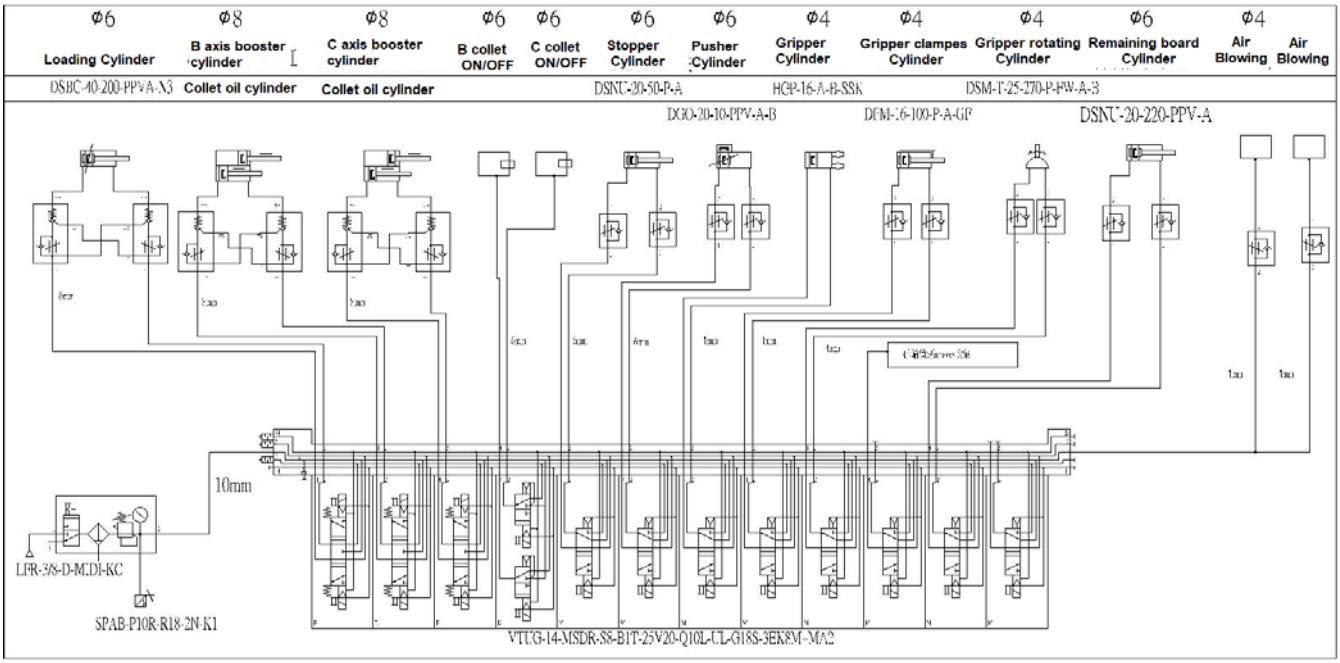
The pressure of outer air supplier needs to up to 6 bar, SRCC air adjusted valve pressure is set 5 bar.

Air pressure sensor is set 4.5 bar

1. The main switch of air pressure unit.
2. Air pressure sensor.
3. Filter element (needed to be exhausted water regularly.)

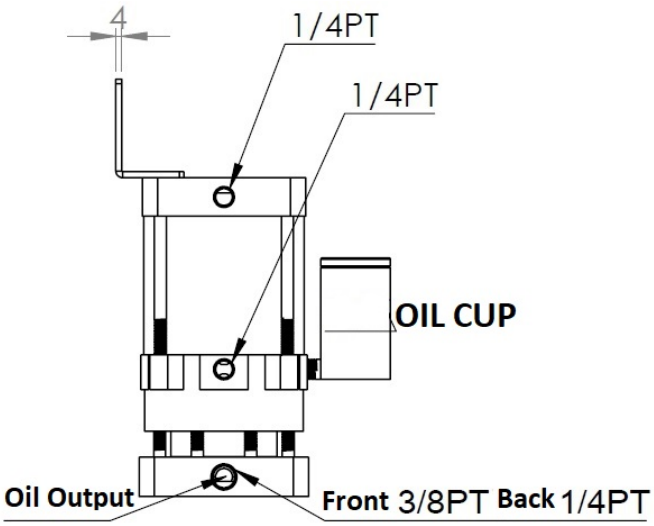


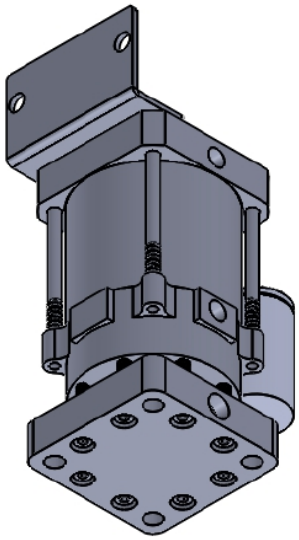
Air pressure solenoid 12 connector.



Solenoid valve of air pressure circuit diagram.

4.7 Booster Cylinder Unit





70CC 150CC Description：

1. Spec：
   - 1.1 Capacity=70CC
   - 1.2 Standard air pressure supply :4-6kg
   - 1.3 Boosted oil pressure supply :24kg-36kg

2. Note：
   - 2.1 Adjusting to the requested air pressure, normally 5kg output pressure supply oil pressure is 31kg.
   - 2.2 Hydraulic oil used **R10 or R32**.
   - 2.3 Recheck supplied voltage, and then connected it.

3. Operation Note
   - 3.1 Press F1 (right collet)、F2 (left collet) to release or clamp at least 15 times, until the oil cup stop bubbling.
   - 3.2 To know the unit is working by checking the oil gauge moving or not.

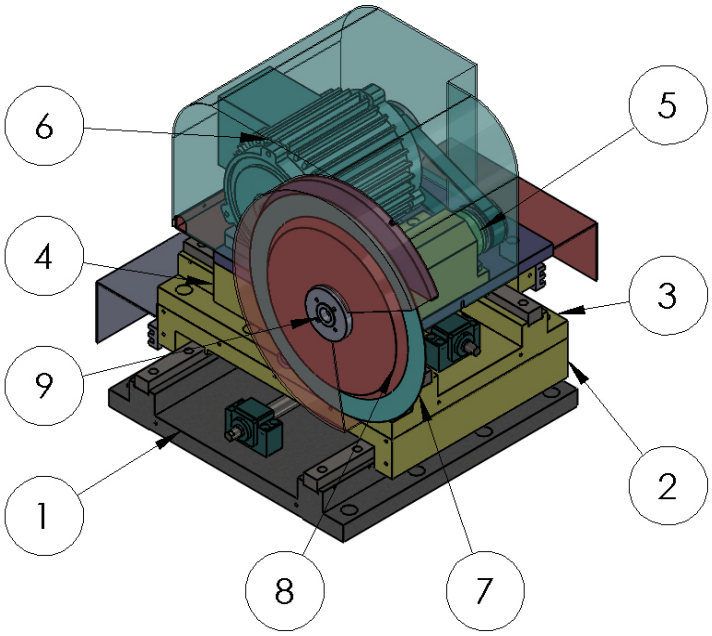
4. Trouble shooting
   - 4.1 Check oil gauge is moving or not.
   - 4.2 Check oil if the oil level is at the highest or safety lowest level.
   - 4.3 Check if the oil pipe is leaking, especially the connection.
   - 4.4 After connecting and no action, check electric circuit is short circuit or the voltage is correct.

5. Warranty
   - 5.1 Normal used is 1-year warranty.
   - 5.2 Natural disasters or human negligence are not covered by the warranty

5 Structure Operation

5.1 X Axis、Y Axis Mechanism and Wheel Exchanged

1. X Axis bed base.
2. X Axis sliding base.
3. Y Axis bed base.
4. Y Axis sliding base.
5. Wheel spindle.
6. Wheel motor.
7. Cutting wheel.
8. Chamfering wheel.
9. Wheel flange.



Dwg 5.1-1

5.1-1 Wheel Exchanged.

1. Dissembling the wheel.

*Taking away the wheel cover.

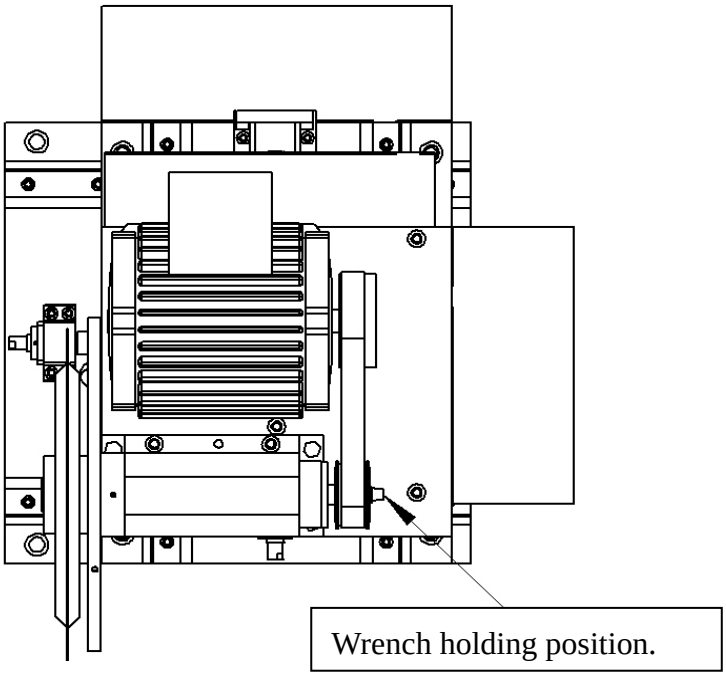
*Use wrench to catch nuts of flange and use adjustable wrench to hold tightly on back side of the **wrench holding position**, clockwise to untight it until screws of flange are loosen.

*Wheel can be taken out.

2. Assembling the wheel.

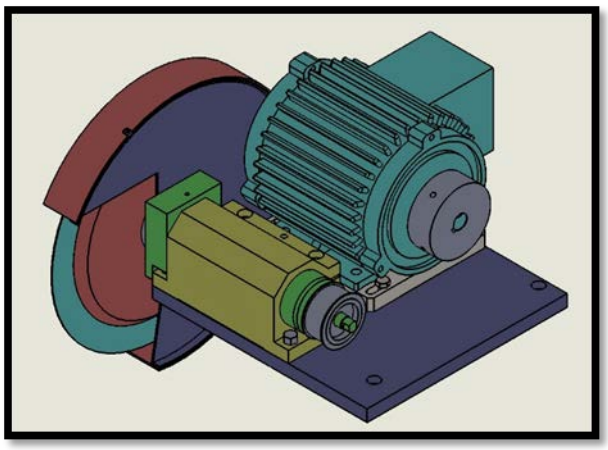
*Put the wheel into flange, tighten up the screws of flange by using wrench to anticlockwise the screw.

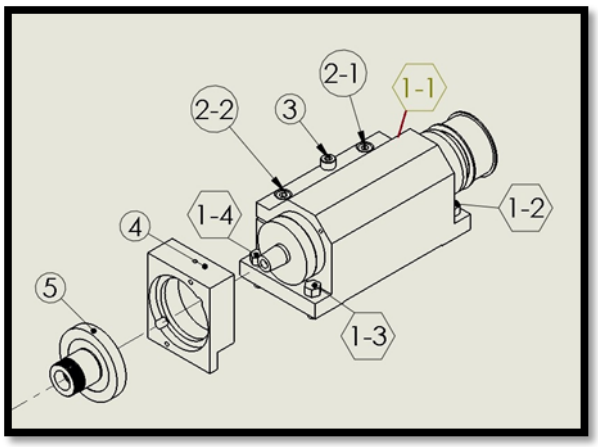
*Assemble the wheel cover.



Dwg. 5.1-2

5.1-2 X & Y Axis Parallelism Checking Steps





Parts List			
1-1~1-4	Screws of spindle base.	2-1~2-2 / 3	Screws of spindle fixed on base.
4	Dust proof cover of spindle.	5	Flange of spindle.

Checking Steps：

1. Disassemble the covers of wheel, chamfering wheel and cutting wheel.
2. Releasing the screw in the flange of spindle.

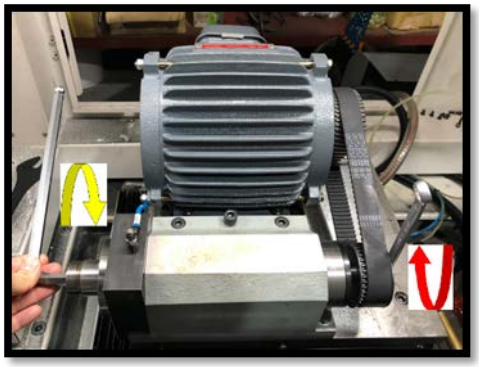


Fig. 2.1

3. By using special tool to disassemble the flange of wheel. (Part No.5)

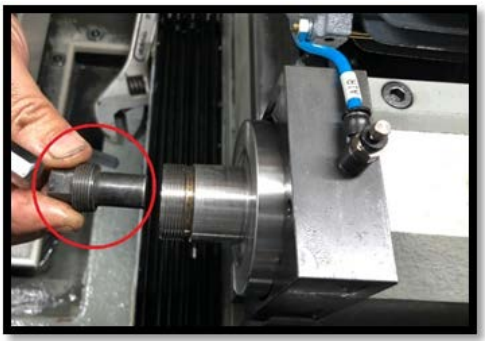
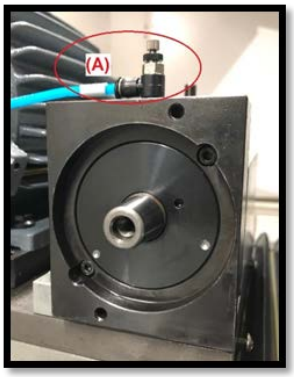


Fig. 3.1

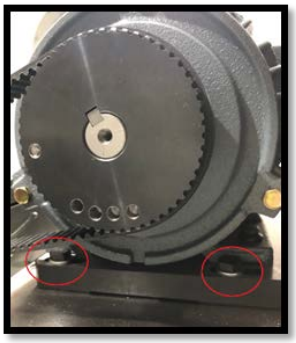


Fig. 3.2

4. Disassemble the dust proof cover. (Part No. 4) (Note：Disassemble the blowing tube (A) it's not necessary.)



5. Note：Do not release the screws (Part No. 2-1~2-2) and (Part No. 3).
6. Loosen the screws on motor board, in order to move the motor to loosen the belt.



7. Put the gauge on side of spindle, where's position is shown on the Fig 6.1 and 6.2, move X axis to measure the parallelism of spindle difference.



Fig 6.1

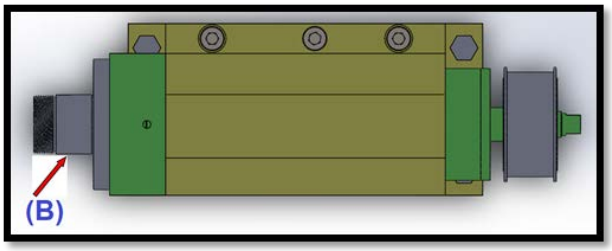


Fig 6.2 (Spindle Up View)

8. After measuring, if the parallelism of spindle is slightly above, which looks like Fig 8.1, loosen 3 screws, (Part No. 1-2 / 1-3 / 1-4) (Do not loose screws of Part No.1-1), and use copper bar to slightly kick and adjust it. (Recommendation is under 0.01mm)

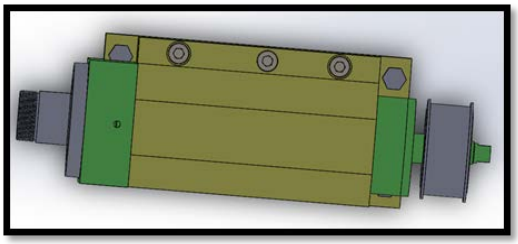


Fig 8.1

9. After measuring, if the parallelism of spindle is slightly down, which looks like Fig 9.1, loosen 3 screws, (Part No. 1-1 / 1-3 / 1-4) (Do not loose screws of Part No.1-2), and use copper bar to slightly kick and adjust it. (Recommendation is under 0.01mm)

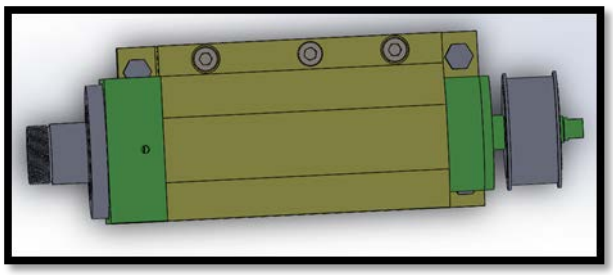


Fig 9.1

10. After adjusting, tight up all the screws on the spindle base, and in order assembling back the Part No. 4 dust proof cover of spindle and Part No. 5 flange of spindle.

Notification：

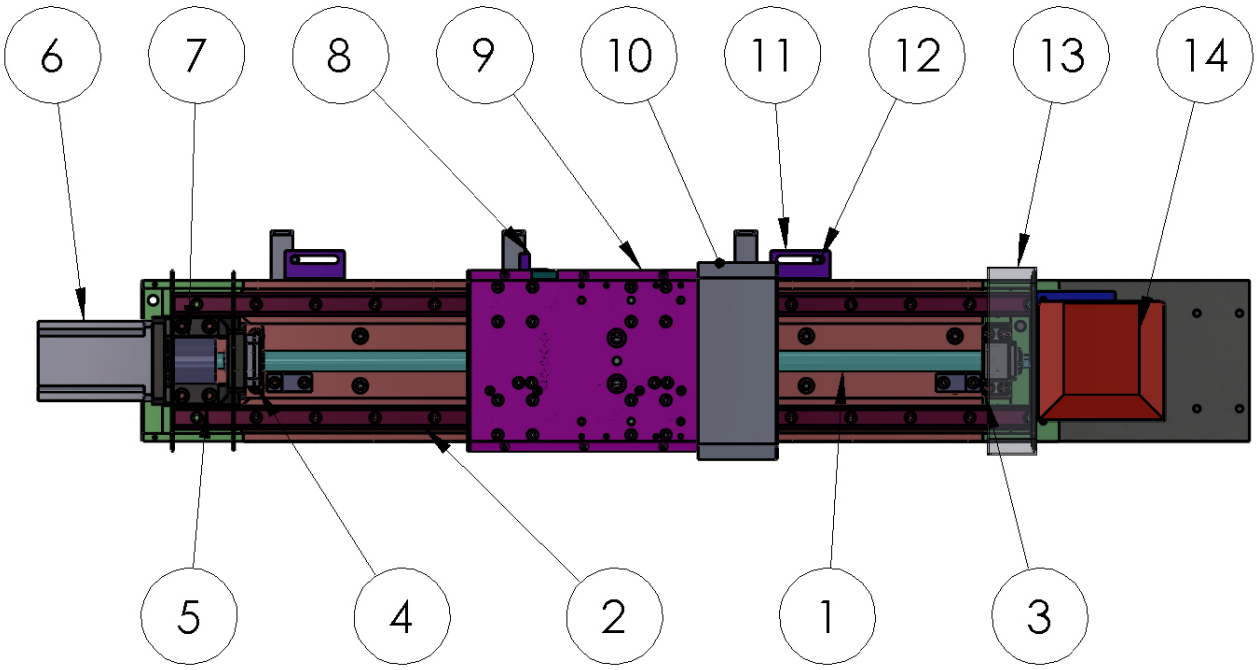
a. Adjust the belt to proper tightness, and tight up the screws on the motor fix board.
b. While assembling the dust proof cover, rotate the spindle manually in order to make sure the dust proof cover is in the proper position without interfering.
c. When assembling the inner wheel cover, be aware of averaging the gap between the rounds of spindle and inner cover. (See Fig. C-1), make sure this assembling without interfering.



Fig C-1

d. When all parts are assembled back：
   d.1 Rotate the wheel spindle manually, in order to make sure the wheel cover is not interfered to the cutting wheel.
   d.2 Rotate the spindle to make sure the belt is in proper tightness.
   d.3 By using hand-wheel to rotate and move X and Y axis to double check the movement are no problem.

5.2 A Axis Mechanism

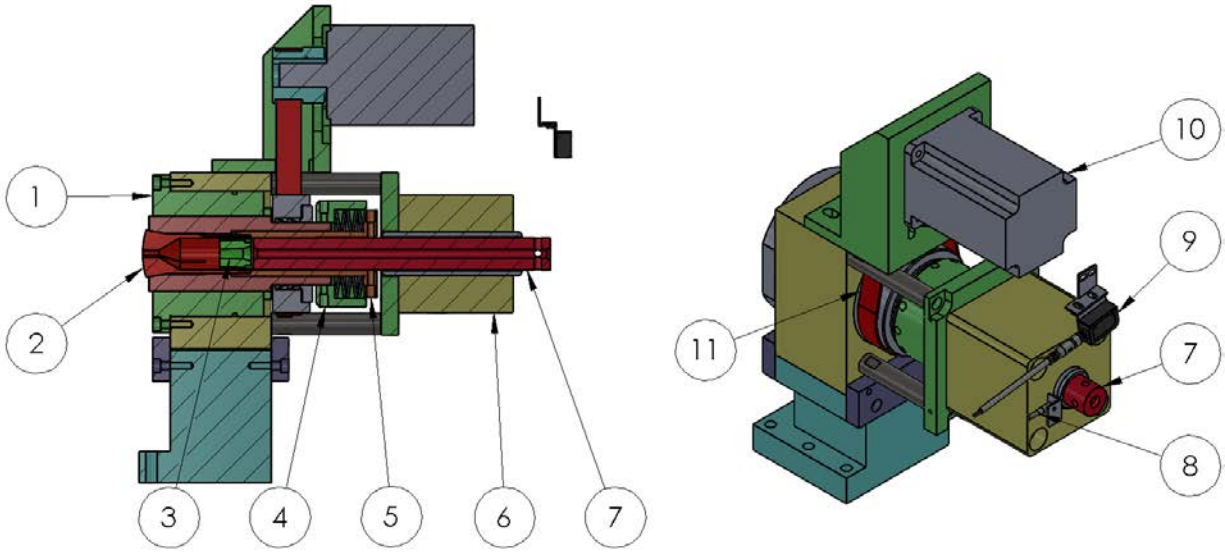


Dwg. 5.2-1

1. Ballscrew
2. Linear Guide
3. Front screw rod fixed base
4. Back screw rod fixed base
5. Servo motor fixed base
6. 750W serve motor
7. Couplings
8. Sensor film
9. Slider board
10. Move table side of water stopper.
11. Sensor fixed board
12. Sensor
13. Front water stopper
14. Scrap plate

5.3 B Axis Mechanism

5.3-1 B Axis Mechanism



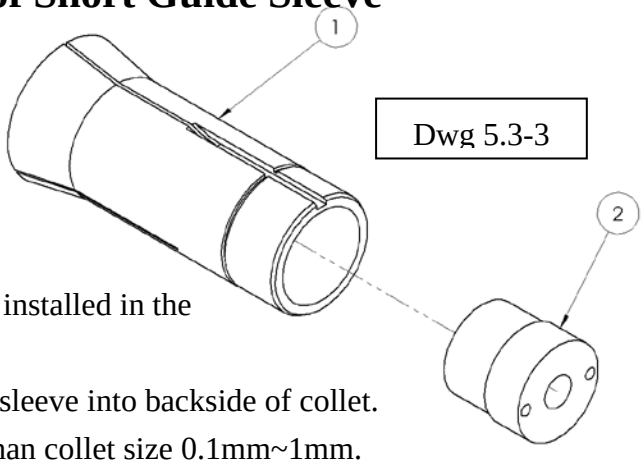
Dwg 5.3-1

1. B axis spindle
2. 5C collet
3. Short sleeve
   Short sleeve specification: inner hole 4、5、6 ~ 21mm (1mm one size only.)
4. Spring cover
   Spring cover has 12 holes, which are used to assemble the collet, 4 of 12 holes have socket set screws inside to fasten spring cover.
5. Collet pull rod
   Connected with the collet and tighten up.
6. Hydraulic pressure cylinder
   When collet is opened, use hydraulic pressure cylinder to push out.
7. Long guide sleeve
   Long guide sleeve specification: (3mm~5mm) (5mm~7mm) (7mm~11mm) (11mm~15mm) (15mm~19mm)
8. Collet closed Sensor
   Sensor lights on when close the collet.
9. Guide sleeve Sensor
   To detect if any extraneous substance between guide sleeve and V block.
   When sensor detects any extraneous substance, Z axis isn't able to be moved.
10. 750W servo motor
11. B axis belt



Dwg 5.3-2(Spanner Wrench)

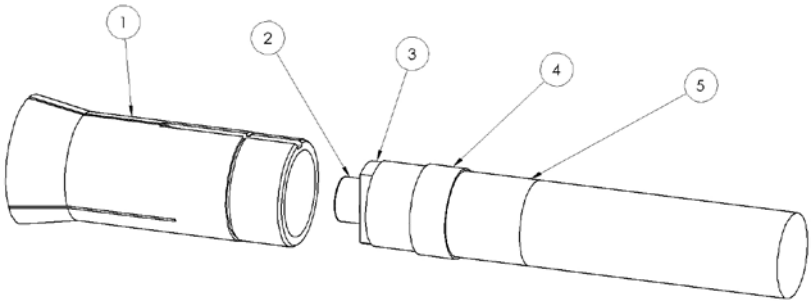
5.3-2 Instruction and Exchanging of Short Guide Sleeve



Dwg 5.3-3

1. 5C collet
2. Short guide sleeve

- To install the collet, short guide sleeve must be installed in the backside of collet.
- Use spanner wrench to tight up the short guide sleeve into backside of collet.
- The size of short guide sleeve must be bigger than collet size 0.1mm~1mm.



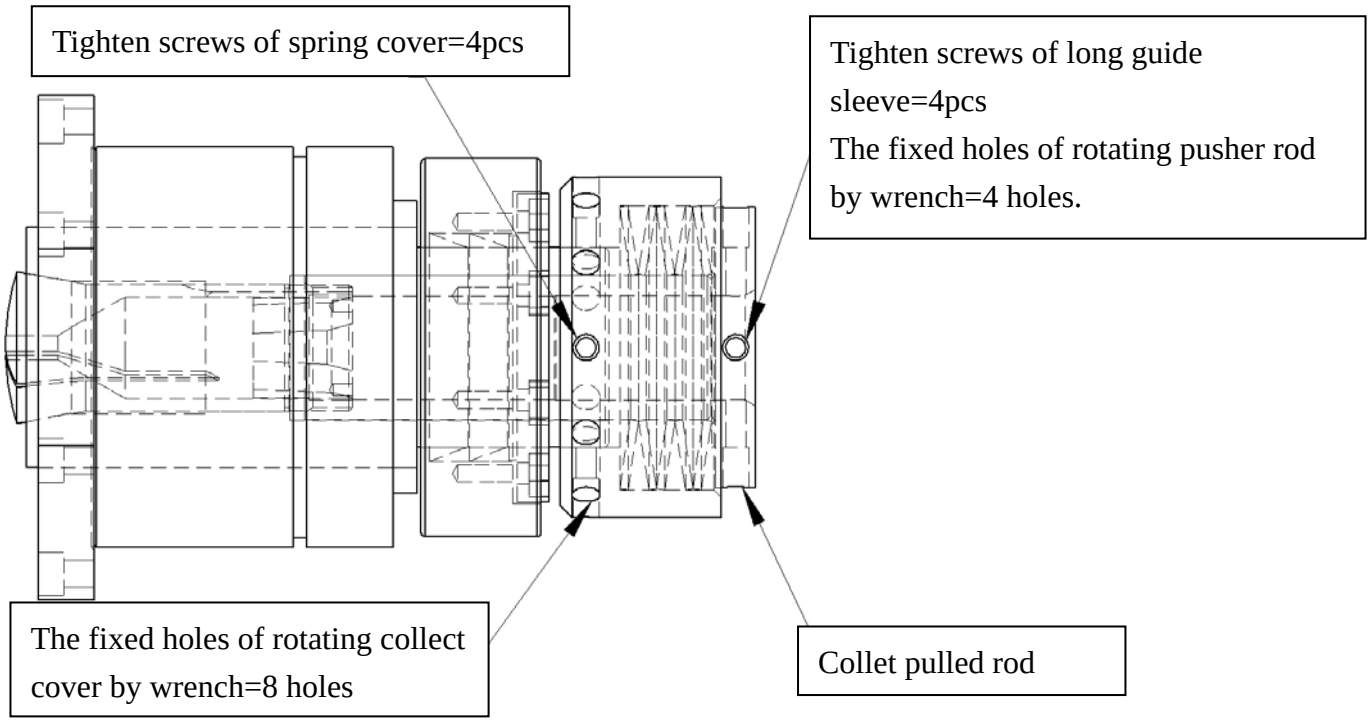
1. 5C collet
2. Tool screw
3. Tool washer
4. Short guide sleeve
5. Tighten tool

Up to size of OD 16mm must use tool to tighten up to fasten the short guide sleeve.

- Fasten the short guide sleeve on the tool.
- By using tool to tight up the short guide sleeve into backside of collet.

Dwg 5.3-4

5.3-3 Disassemble the Collet



Dwg 5.3-5

Step

1. Release the fixed screws of spring cover.
2. By using wrench to fasten on the holes of rotating collet cover.
3. The spring cover move near to gear wheel by rotating clockwise. (about 1~2 circle)
4. By using wrench to fasten on the fixed holes of puller rod.
5. Rotate anticlockwise the puller rod until collet is taken out.

5.3-4 Disassemble the Collet

Step

1. Put the screwed guide sleeve into the collet.
2. Rotate the puller rod clock wisely until collet and puller rod are tighten up.
3. Put the material (workpiece) into the collet.
4. Spring cover caused tension by rotating anticlockwise and move close to the puller rod until collet tighten up the material. (workpiece).
5. When collect tighten up the material (workpiece), continue to rotate spring cover about 3/4 circle.
6. Tighten up the screws on spring cover. (4 screws).

5.3-5 Exchange the Long Guide Sleeve

Taking out the long guide sleeve.

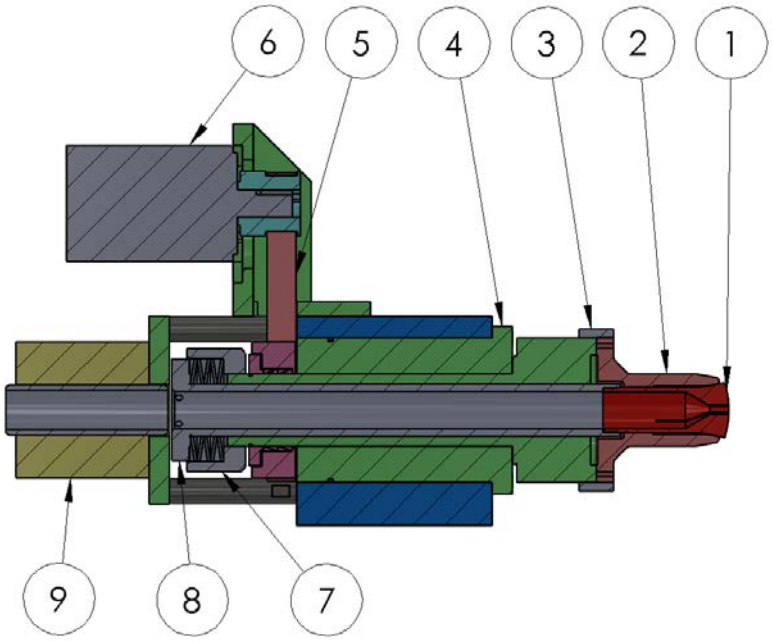
1. Release the screws of long guide sleeve. (4 screws)
2. Fasten the wrench on the position of long guide sleeve. (The wrench fixed holes are on the back side of long guide sleeve.)
3. Taking out the long guide sleeve. (Before taking it out, make sure the height of Z axis is not interfered.)

Installed the long guide sleeve.

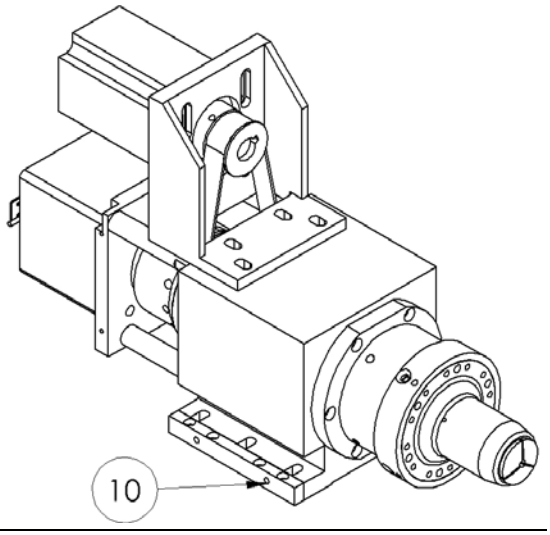
1. Put the long guide sleeve into backside of B axis.
2. Fasten the long guide sleeve. (4 screws)
3. The O.D 18.5mm and above don't need to use long guide sleeve.

*When the bar O.D is over 18.5mm, the screws of long guide sleeve must be taken out to prevent from screws interfering and loosing.

5.4 C Axis Mechanism

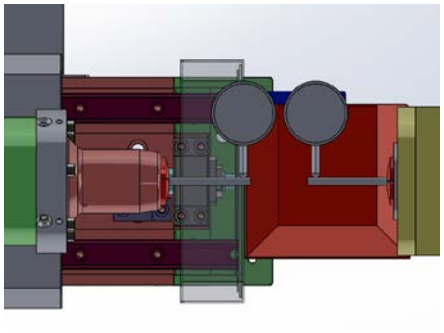
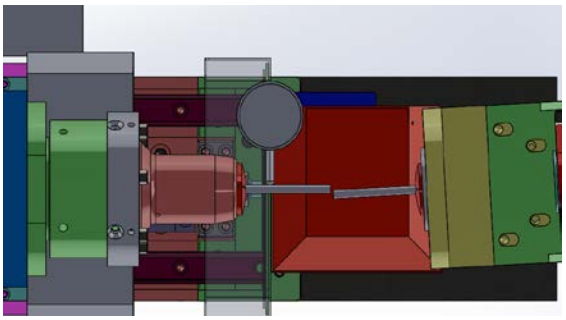
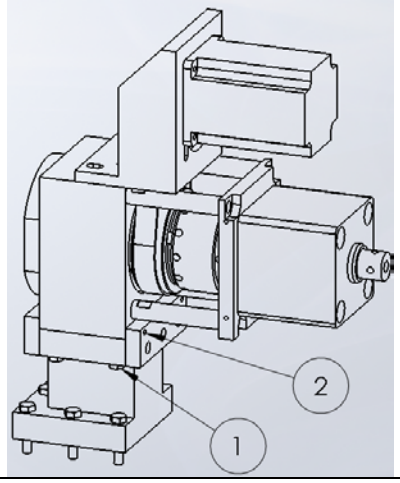
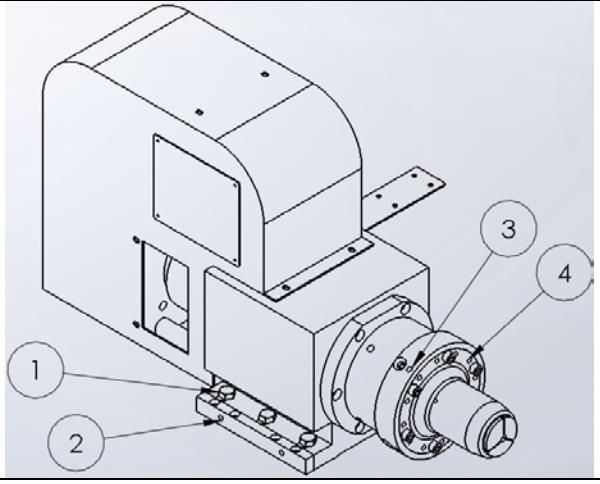


1. 5C collet
2. Collet sleeve
3. Collet concentric adjusting ring.
4. C axis spindle
5. C axis belt
6. 750W servo motor.
7. Spring cover
8. Puller rod
9. Hydraulic pressure cylinder
10. Parallelism adjusting device.

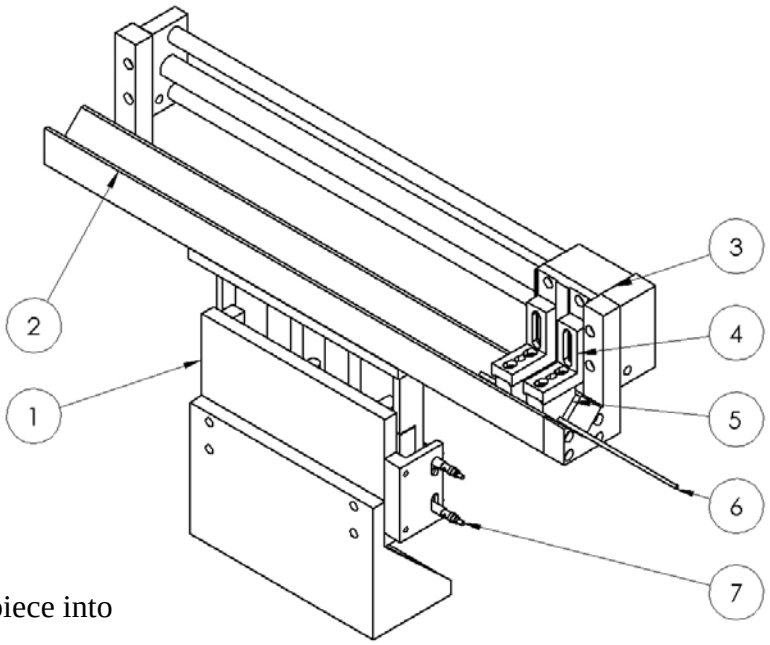


- The steps of exchange C axis collet are the same as B axis collet.
- Both bases of B axis and C axis have parallelism adjusting device to adjust the parallelism.
- The function of collect concentric adjusting ring is to adjust the collet and workpiece are on the same parallel when collets grip the material (workpiece).

5.4.1 B & C Axis Parallelism and concentricity Checking Steps

<table>
<tr><td>Step 1</td><td>Step 2</td></tr>
<tr><td>
*Sample drawing.</td><td>
*Sample drawing.</td></tr>
<tr><td>*Each collet has to be adjusted round-out individually.
1. Each B axis and C axis clamp a glossy bar. (Length exposed about 50mm)
2. Adjusting the round-out by raping on the end of bar. (Recommend round-out is less than 0.005mm)</td><td>3. After round-out is adjusted less than 0.005mm, do not release the collet. (Keep clamp the glossy after round-out is done adjusting.)
4. Use Dial Indicator to measure the side of bar.
5. Put the gauge on X axis, and move X axis to gauge the parallelism of B axis and C axis.
6. Adjusting the B axis and C axis parallelism by release and tight up the screws refer to drawing A and B.
7. By adjusting the screws of drawing A No.1 & 2 and drawing B No. 1~4 to let B axis and C axis are the same parallelism. (Recommend parallelism is less than 0.01mm)</td></tr>
<tr><td>Screw Adjusting –B axis</td><td>Screw Adjusting –C axis</td></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>1. B axis fixing screw. (M8 * 4pcs)
2. Right and left adjustment screw. (M6 * 4pcs)</td><td>1. C axis fixing screw. (M8 * 6 pcs)
2. Left and right adjustment screw. (M6 * 4 pcs)
3. Concentricity adjustment screw. (M6 *4 pcs)
4. Round-out adjustment screw. (M6 *12 pcs)</td></tr>
</table>

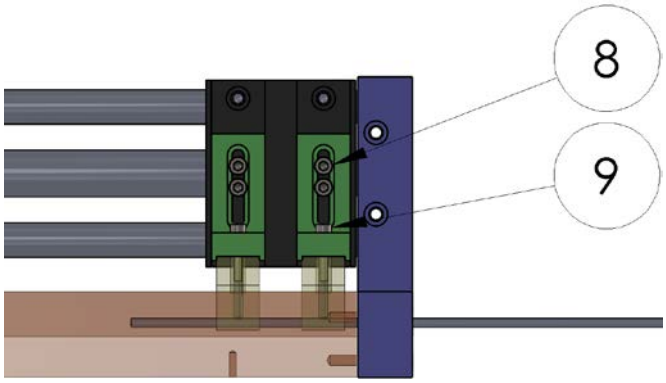
5.5 Z Axis Mechanism



1. Z axis lifting mechanism
2. Loading V block
3. Pusher cylinder
4. Pusher rod up fixed
5. Pusher rod below fixed
6. Pusher rod
7. Limited sensor

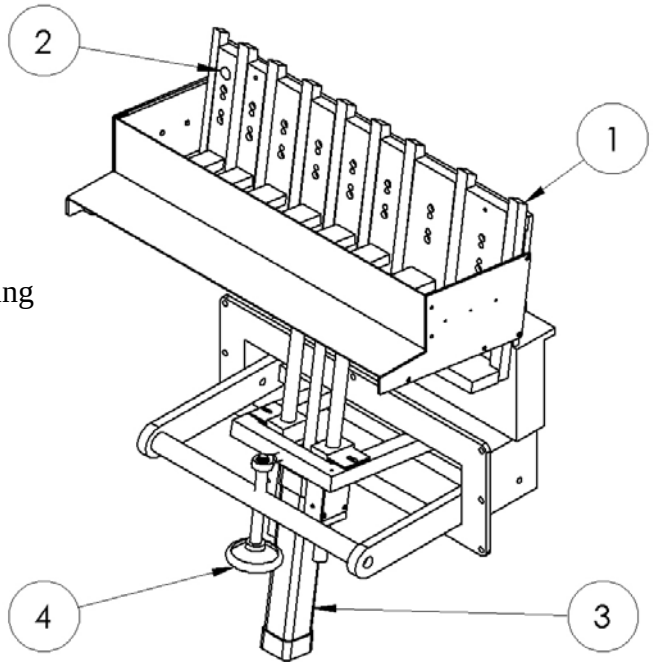
- Function：to push the material (workpiece into collet)
- The size of pusher rod: Diameter 4 mm and 6 mm; both lengths of pusher rod depend on different length of workpiece to adjust or cut shorter by user.
- There are 2 kinds of fixed holes, which are 4mm and 6mm, on pusher rod below fixed mechanism. Diameter 4mm are applied for the workpiece smaller than 6mm.

8. Up pusher rod fixed screws
9. Pusher rod fixed screw



- When the dimeter of workpiece is changed, the pusher rod up fixed need to be adjusted the position.
- Release the screws (4pcs) of pusher rod up fixed to adjust the position of up pusher rod fixed.
- When the length of workpiece are different or workpiece can’t be pushed to the position, release the screw of pusher rod fixed to adjust the position of pusher rod.
- When loading the workpiece, the workpieces are delivered from loading mechanism into V block, pusher cylinder will push the material into collet and touch off the loading stopper.
- After collet grips the workpiece, the pusher cylinder will automatically return back to the position.
- If the sensor of guide sleeve detects the workpiece or abnormal substance, Z axis can’t be acted the movement of up and down.

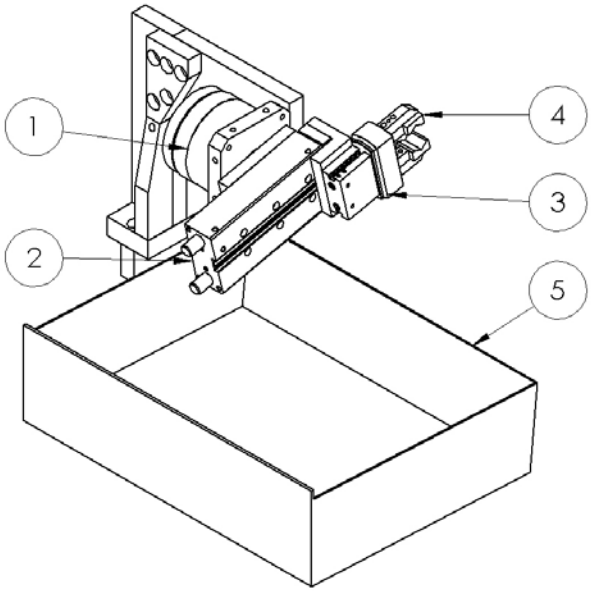
5.6 Loading Structure



1. Loading system-loading arm
2. Loading sensor
3. Loading cylinder
4. Hand wheel

- When loading, the loading cylinder drives of loading arm is loading the workpiece into V block.
- When previously workpiece is being cut, next workpiece will be loaded and waited for cutting procedure on the loading sensor position.
- When previously workpiece is done cutting, the next workpiece will load into V block of Z axis and process the pushing action into collet.
- It would be alarm when loading continually 3 times without workpieces by detective sensor, the machine will be stopped after previously workpiece is done cutting as a single mode.
- Loading plate capacity- (138x70)÷(workpiece diameter^2)=the numbers of workpiece.
- When the diameter of workpiece is changed, pusher arm can be adjusted the position by rotating the hand wheel.
- Loading length limited: 100mm ~ 600mm

5.7 Unloading Rotary Arm Mechanism



1. Rotary cylinder
2. Arm cylinder
3. Gripper cylinder
4. Gripper
5. Unloading plate

● Unloading action

When A axis is backward to unloading position, the arm cylinder stretches out to grip the workpiece, and loading the workpiece into unloading plate by rotary cylinder.

● When processing the unloading action, unloading plate in the drawer is unable to be opened.

● When the drawer is opened, arm is unable to act until the drawer is completely closed.

● Unloading length limited: 30mm~300mm

● When changing the product line, must chose the proper gripper.

● Gripper specification :(3mm~8mm) (6mm~12mm) (12mm~17mm) (17mm~21.5mm) (21.5mm~25mm)

● Installation step:

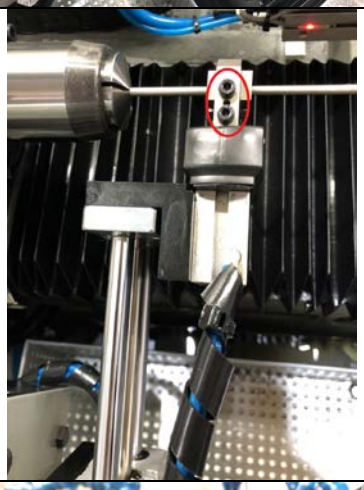
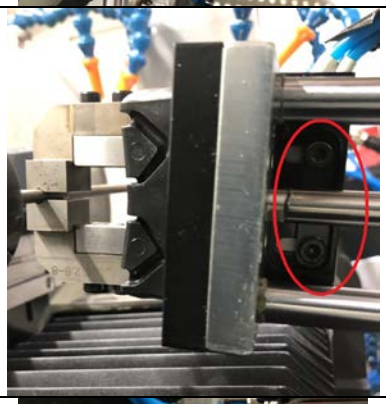
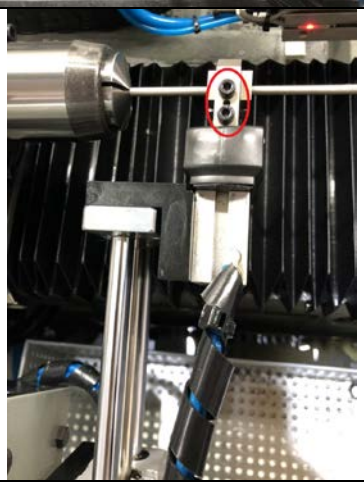
*When change to proper gripper, move the A axis to the back side of gripper.

*C axis grips a workpiece to let arm cylinder stretch out and grip tightly by cylinder.

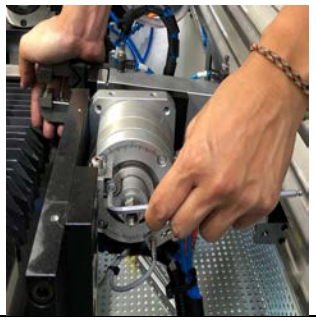
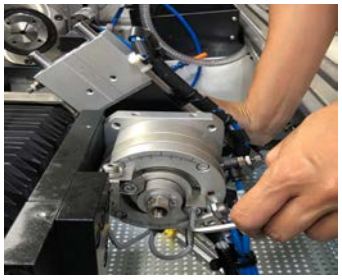
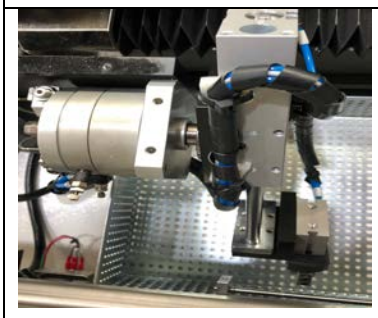
*Release the grippers' screws (x2) and tighten up, restart the action of cylinder.

*Taking out the workpiece to finish the gripper's installation.

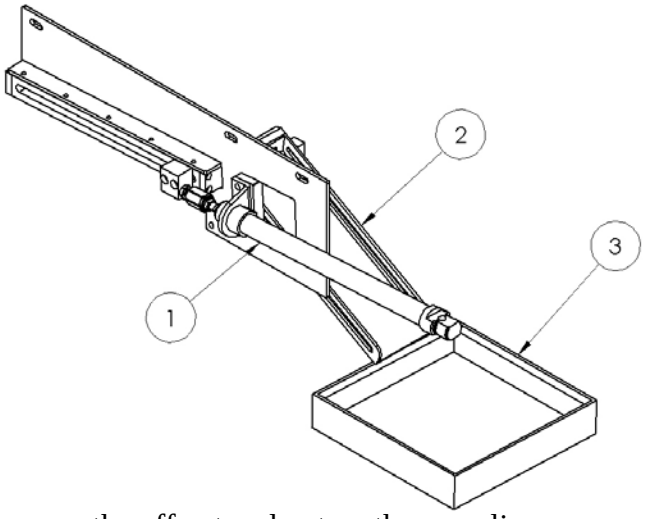
5.7-1 Gripper Adjusting (Minute Adjusting)

Step	Photo Description
	1. If gripper clamp the bar is not smoothly or unable to clamp the bar properly, minute adjust the gripper.
	2. Both collet and gripper clamp the bar, and release the screws on top and down of gripper.
	3. Next to release the screws on the side of gripper and tight it. (Extend the gripper)
	4. Next is to tight the screws on top and down of gripper.

5.7-1 Gripper Adjusting (Correct the Gripper's Angle)

Step	Photo Description
	1. Release the screw in red circle as shown on photo.
	2. Press off the griper to proper position and tighten the left screw.
	3. Left collet clamped a bar, outstretch the griper to make sure the bar is in the center of gripper.
	4. Let the gripper down and press off to the proper position, tighten the right screw.
	5. Outstretch the gripper, if the gripper interferes the blackest, withdraw back the gripper and repeat the step 4 to adjust the position.

5.8 Off Cut Recyling Mechanism



1. Off cut discharged cylinder.
2. Off cut recycling slipping board
3. Unlading plate

Function:

- Collet the off cut
- The off-cut length: 25mm~150mm
- To avoid the collet getting stuck by workpiece, the standard procedure includes discharging the off-cut every time after dressing end.
- After C axis grips the off cut, the rotary am will take over the off cut and put on the recycling slipping board and slip into unloading plate.

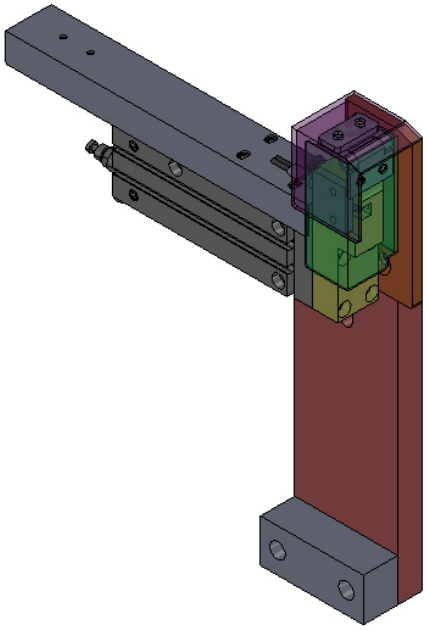
5.9 Wheel Detecting Mechanism

Function:

- To detect the wheel outer diameter amount of wear.
- Setting sensor

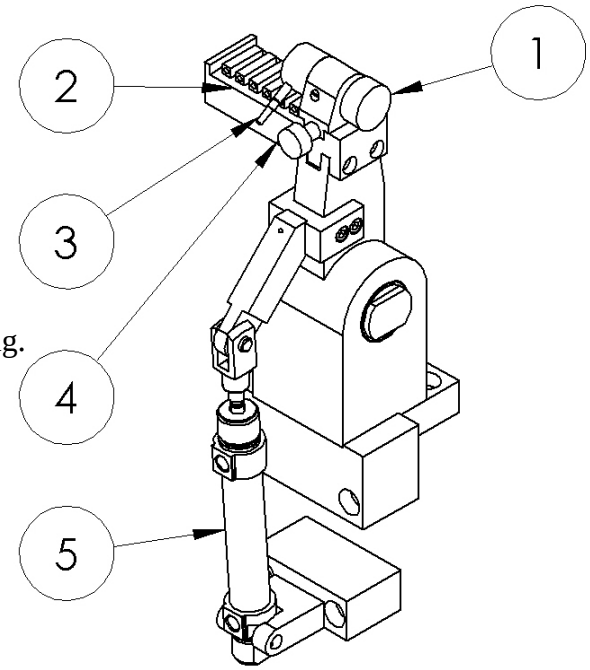
1. Move X axis to detecting position.
2. Move Y axis to the position where the wheel can be lighted up by laser of sensor.
3. Keep pressing the sensor setting button until the light is flashed.
4. Move back the Y axis to the position where the laser of the sensor light off the wheel
5. Press the sensor setting to restore.

- **Reset the sensor only when the sensor is abnormal.**



5.10 Stopper Mechanism

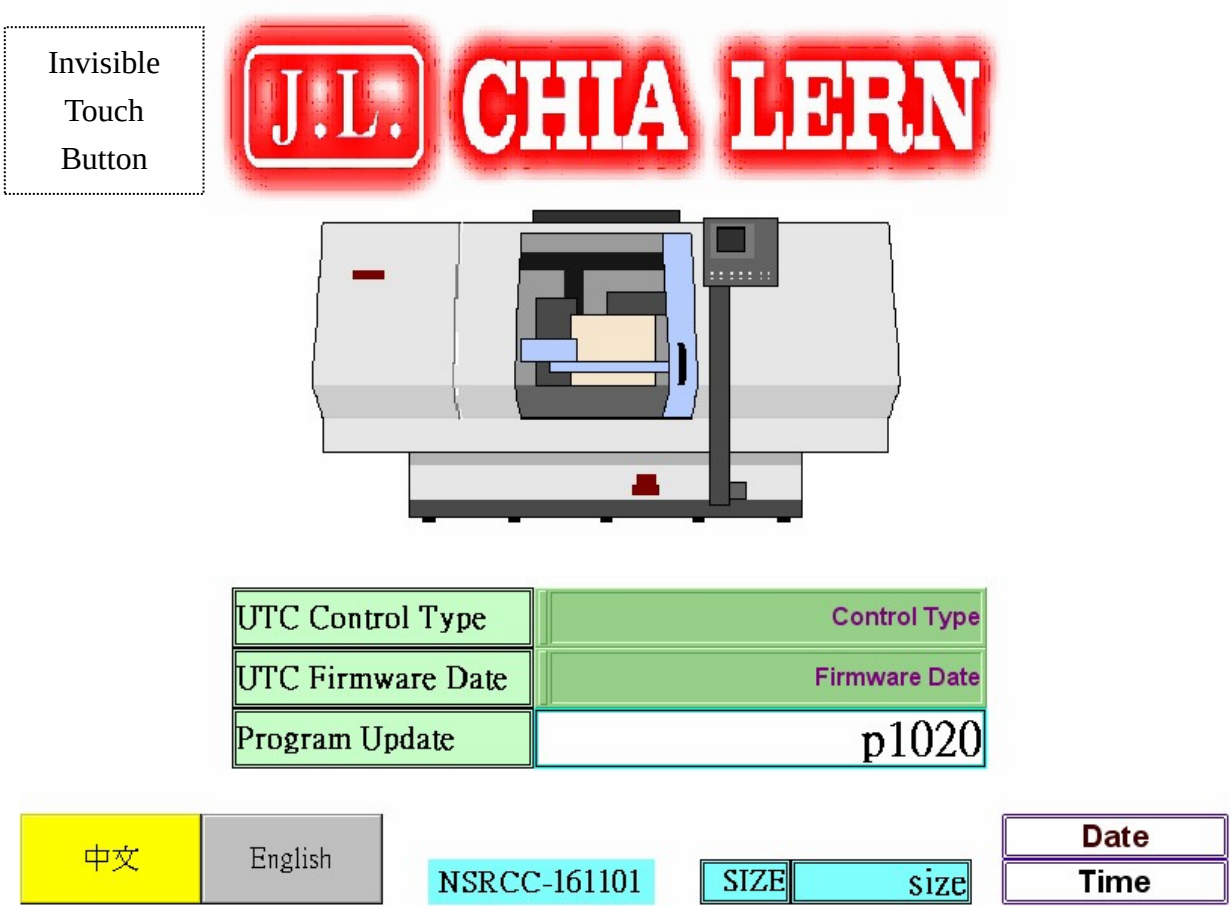
1. Stopper
2. Adjustable stopper base
3. Stopper Sensor
4. Stopper up base + screws
5. Stopper stretching out cylinder



- Fasten the workpiece on gripping position when loading.
- When workpiece is being pushed forward to the collet by pusher rod, the workpiece will be touched off the stopper and detected the stopper sensor, and the collet on B axis will be clamped-on.
- Adjustable stopper base is used to cut pre-point workpiece, there are 8 step lengths can be adjustable. *After adjusting, cutting position (X1_X Cut POS on page “POS Set-1”) must be re-set.

6 Function Introduction

6.1 Starting Up on Screen

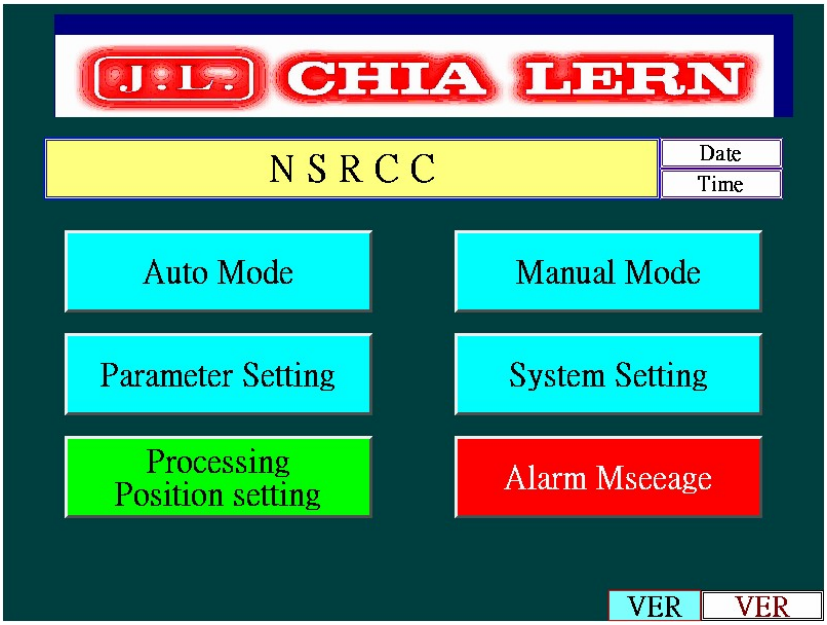


Dwg 6.1-1

- When turn on the machine, screen will be on starting up.
- Chose language to get into the main screen.
- The main screen will be displayed the program version and date.

*Invisible Touch Button: when receive the updated screen file, to press it and find the file name "dlz" to upload the updated screen file to this machine.
(Password: 27882162)

6.2 Main Screen



Dwg 6.2-1

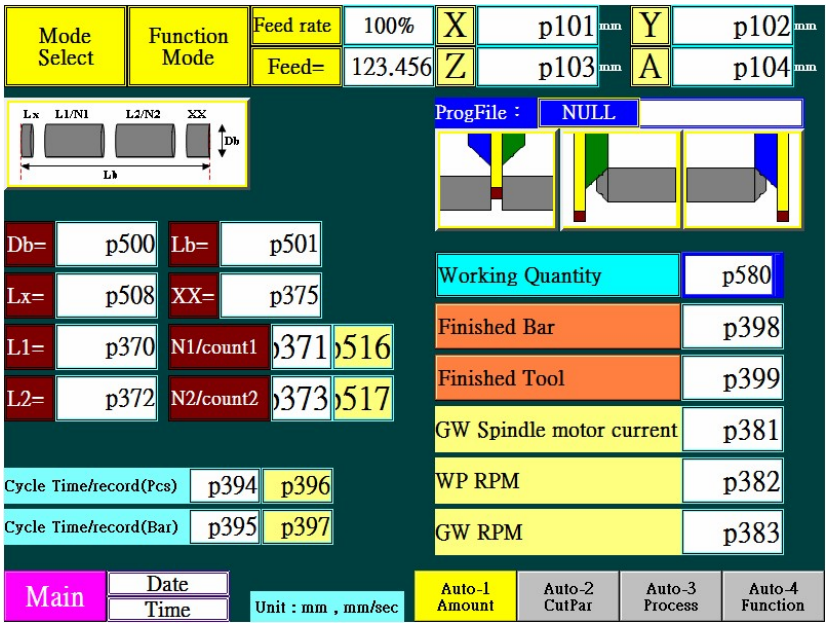
The main screen can get into different operation mode.

- **Auto Mode:**
  *Before auto running the process, operator must turn into "Auto Mode" screen.
  *To operate "Manual Mode", the "Mode Select" and "Mode" on the controller must be turn on "Auto" button.
- **Parameter Setting:** To set the parameter value.
- **Processing Position Setting:** To set the loading, unloading position, wheel position and detect position.
- **Manual Mode:**
  *All the cylinder action can be operated individually on manual screen.
  *To operate "Manual Mode", the "Mode Select" and "Mode" on the controller must be turn on "Manual" button.
- **System Setting:** To set the internal system value. (OEM set) (Password:89823631)
- **Alarm Massage:** When abnormal condition is happened, screen will turn to alarm massage screen.

6.3 Screen Description

6.3.1 Auto Mode

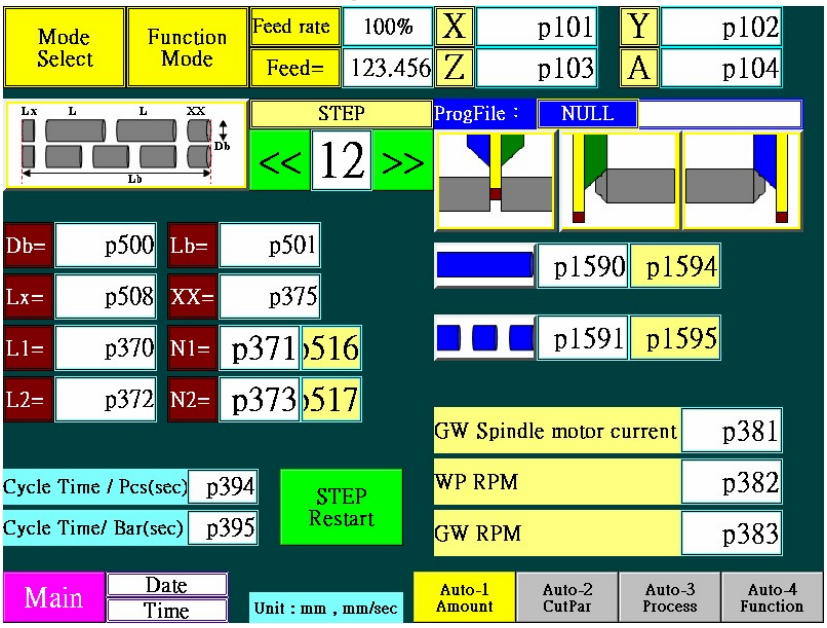
6.3.1-1-1 Auto-1 Amount (For Cutting Mode-1)



Auto-1 Processed Amount (For cutting mode-1)

1.	Db：	Display the bar length	2.	Lb：	Display the bar total length
3.	Lx：	Display the dressing length	4.	XX：	Display the end dressing length
5.	L1：	Display L1 cutting length	6.	L2：	Display L2 cutting length
7.	N1/count：	Display the amount of cutting pieces for L1. / Display the amount of L1 cutting pieces currently have been done.			
8.	N2/count：	Display the amount of cutting pieces for L2. / Display the amount of L2 cutting pieces currently have been done.			
9.	Cycle Time /record (pcs)：	Display the time of each piece for cutting and chamfering procedure. / Record last piece's cycle time			
10.	Cycle Time /record (bar)：	Display the time of each bar's procedure. / Record last bar's cycle time.			
11.	Working Quanity：	Setting total bar q'ty which is going to be processed.			
	*If "power OFF control" is ON, after the bar q'ty is done, program will shut off the machine. *If "power OFF control" is OFF, after the bar q'ty is done, program will stop the machine and turn the light to yellow.				
12.	Finished Bar：	Display total amount of processing piece. (Quantity is accumulated.)			
13.	GW spindle motor current：	Display current wheel electric loading current.			
14.	WP RPM：	Display current RPM for B axis and C axis.			
15.	GP RPM ：	Display wheel RPM.			

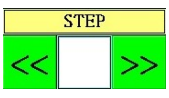
6.3.1.1-1-2 Auto -1 Amount (For Cutting Mode-2)



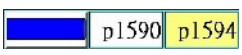
Auto-1 Processed Amount (For Cutting Mode-2)

1. Db：Display the bar length
2. Lb：Display the bar total length
3. Lx：Display the dressing length
4. XX：Display the end dressing length
5. L1：Display L1 cutting length
6. N1：Display the amount of cutting pieces for L1. / Display the amount of L1 cutting pieces currently have been done.
7. L2： Display L1 cutting length
8. N2： Display the amount of cutting pieces for L2. / Display the amount of L2 cutting pieces currently have been done.
9. Cycle Time/pcs (sec)：Display the time of each piece for cutting and chamfering procedure. / Record last piece's cycle time.
10. Cycle Time/Bar (sec)：Display the time of each bar's procedure. / Record last bar's cycle time.
11. GW spindle motor current：Display current wheel electric current loading.
12. WP RPM：Display current RPM for B axis and C axis.
13. GP RPM：Display wheel RPM

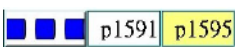
Function Description (Refer to page "Cutting Mode-2.**):**



1. Before pressing "Cycle Start", it's able to select which step to start processing.
2. After pressing "Cycle Start", Display current processing step.



1. (p1590) Display current single step needs the amount of bar.
2. (p1594) Display the number of processing bar is being processed in current step.

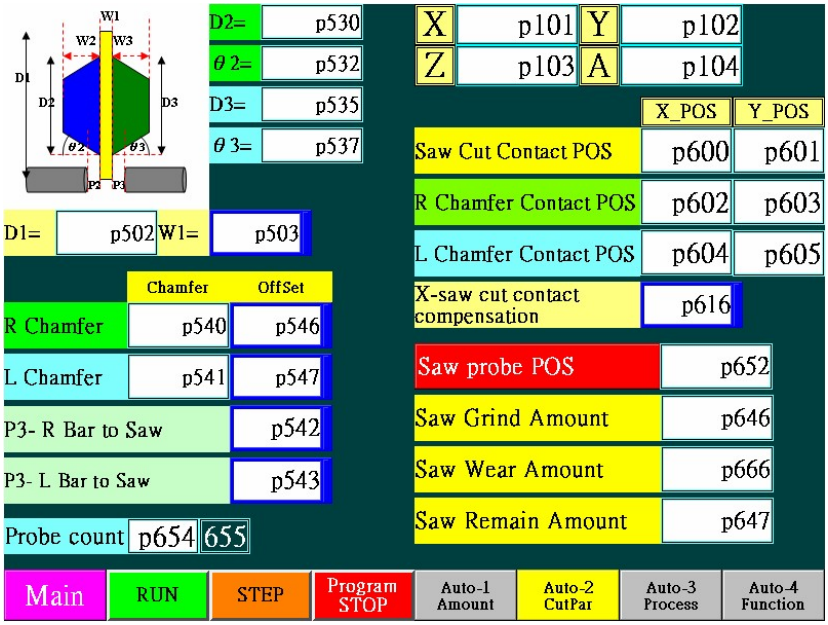


1. (p1591) Display current single step needs the number of cutting piece.
2. (p1595) Display the number of cutting piece in current single step.



Before processing, this button is pressed necessary to restart all steps.

6.3.1-2 Auto-2 CutPar (Wheel Data)



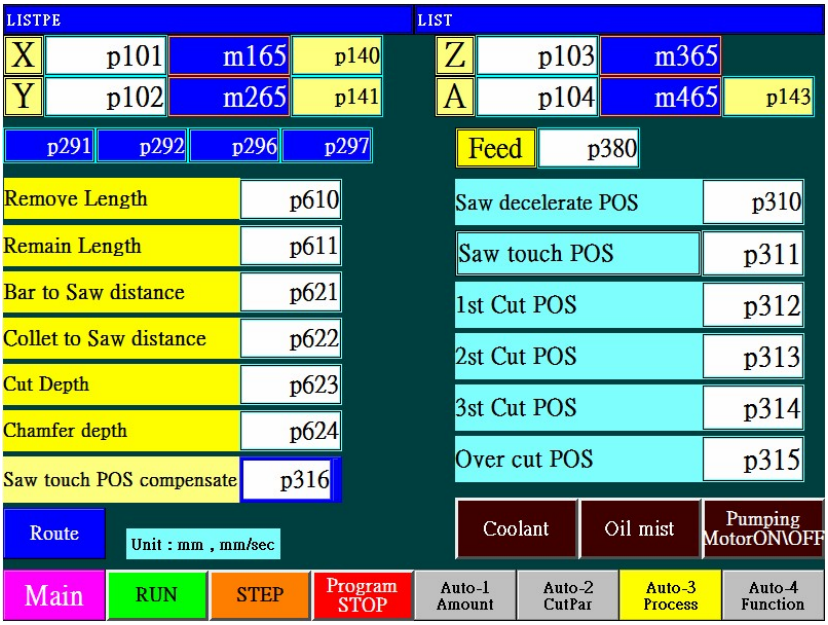
Auto-2 Wheel Data

1.	D2	Left chamfering wheel diameter	2.	θ 2	Left chamfering wheel angle
3.	D3	Right chamfering wheel diameter	4.	θ 3	Right chamfering wheel angle
5.	D1	Cutting wheel diameter.	6.	W1	Setting the width of cutting wheel

	X-POS	Y-POS
Saw Cut Contact POS	X axis touches saw position when doing cutting	Y axis touches position when doing cutting
R Chamfer Contact POS	X axis touches position when doing right chamfering.	Y axis touches position when doing right chamfering.
L Chamfer Contact POS	X axis touches position when doing left chamfering.	Y axis touches position when doing left chamfering.
X-saw cut contact compensation	Offset the cutting position in X- axis touching position.	
Saw Probe POS	Display the Y axis of saw probe position.	
Saw Grind Amount	Display the available wear amount.	
Saw Wear Amount	Display the wore amount	
Saw Remain Amount	Display remaining available wear amount	
*If saw remains below to 0.5, alarm will remind user and stop the machine after current bar finish processing.		

	Chamfer	Offset
R Chamfer	Right chamfering amount	Offset the right chamfering amount
L Chamfer	Left chamfering amount	Offset the left chamfering amount
P3-R Bar to Saw		The wheel distance when offset the right chamfering.
P2-L Bar to Saw		The wheel distance when offset the left chamfering.
Probe count (Saw probe)	Display bar quantity has been set to do probe.	Display currently bar quantity that has been processing.

6.3.1-3 Auto-3 Process



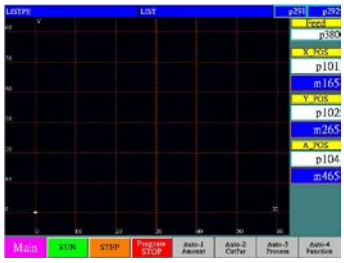
Auto-3 Procedure Monitor

Remove Length	The length of bar has been cut.
Remain Length	The length of bar hasn't been cut yet.
Bar to Saw Distance	Relative Y axis position between wheel and bar.
Collet to Saw Distance	The distance between collet of C axis to Saw.
Cut Depth	Current cutting depth
Chamfer Depth	Current chamfering depth
Saw Touch POS compensate	If cutting wheel is touched bar early than setting value, that cutting wheel touches the bar that make harder touches sound, that this function is able to compensate the Y axis. (suggest to set start from -0.5)
Saw Decelerate POS	Y axis buffer position between saw and bar before cutting.
Saw Touch POS	Y axis touches position between saw and bar.
1st Cut POS	Y axis position when cutting 1st step depth.
2st Cut POS	Y axis position when cutting 2nd step depth.
3st Cut POS	Y axis position when cutting 3rd step depth.
Over Cut POS	Y axis position when cut pass through bar center.

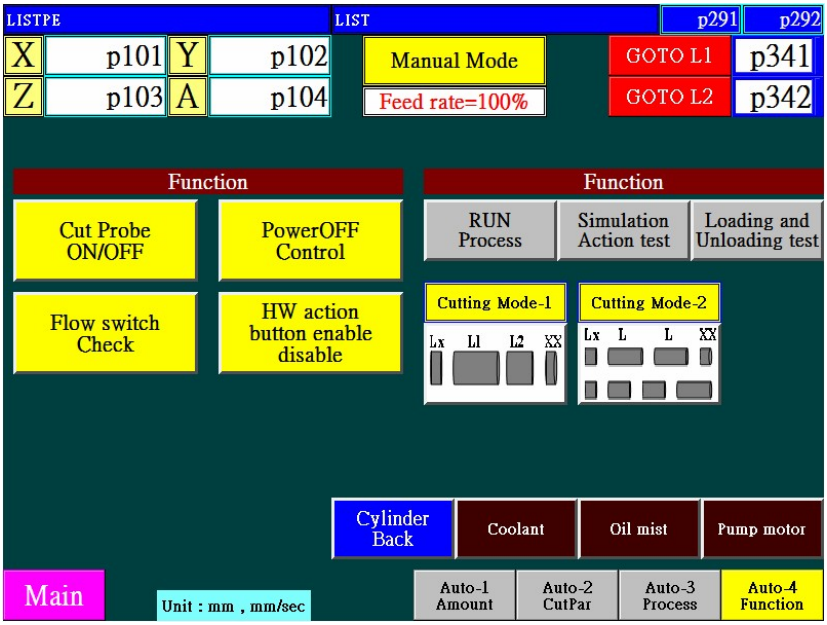
Description：

1. **Run:** Continually processing the program.
2. **Step:** While processing, press this button will only process single step, after this single step is finished, the machine will pause in process with green light flashing; if program needs to be continually processed, press "RUN".
3. **Program STOP:** This function is to quit and stop the program immediately without the program being finished.
4. **Route:** Press "Route" button to turn the page to processing monitor.





6.3.1-4 Auto-4 Function (Function Option)



Auto-4 Function Option

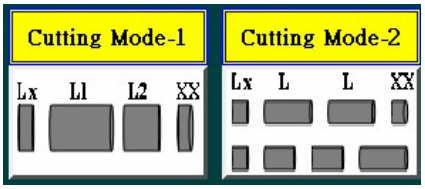
- Each function ON/OFF.
- Function is chosen in yellow; function isn't chosen in gray.

1. Cut Probe：Saw probe ON / OFF
2. Power OFF Control: Auto power OFF.

   *When function is on, after processing "AUTO-1 Working Quantity" is done, program will shut down automatically.
3. Flow Switch Check: Flow amount check ON / OFF. (Flow switch is option)
4. HW action button enable disable：ON/OFF the Hand wheel action.
5. Run Process: Running process.
6. Simulation Action Test: Simulate to perform all running process.

   (Do not put the bar into the machine.)
7. Loading and Unloading Test: Simulate to perform the auto loading and unloading producer.

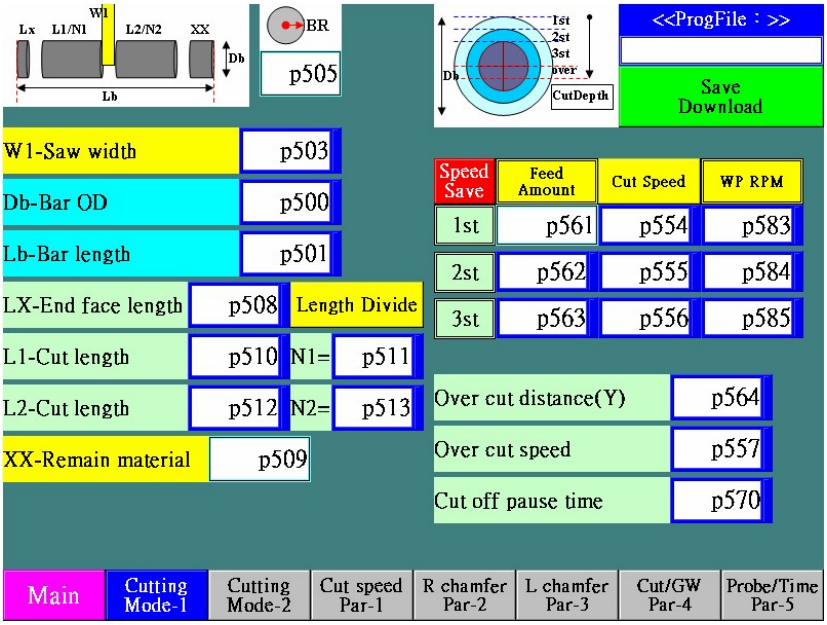
   (Bar's length must be blow 300 mm and set the bar's length)
8. Cutting Mode-1: Standard cutting and chamfering mode.
9. Cutting Mode-2: Single bar diameter, 10 cutting combinations can be set.
10. Display currently setting mode, selected mode will become "Yellow" color.



11. Cylinder Back: Press to turn all positions back.

6.3.2 Parameter Setting

6.3.2-1 Cutting Mode-1



Cutting Mode-1

*Description: The single bar can be cut in 2 different lengths.

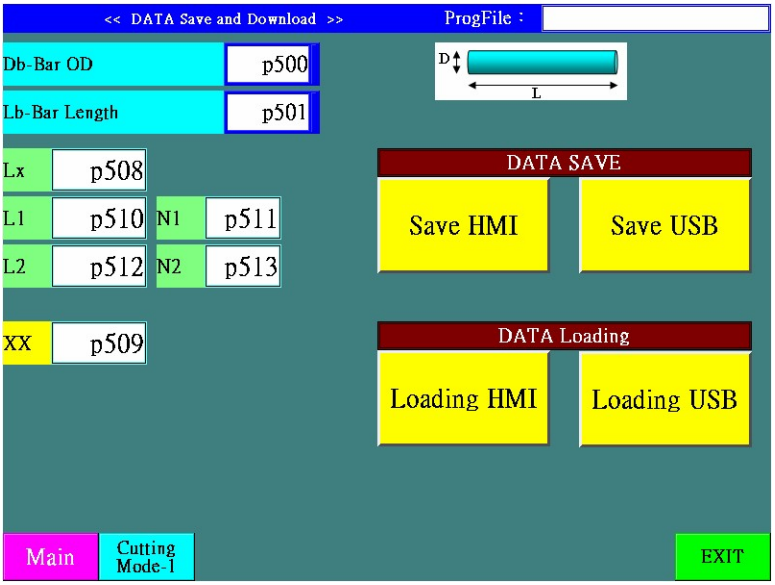
Setting the value of bar and saw

W1-Saw Width	Setting the wheel width.	
Db-Bar OD	Setting the bar diameter.	
Lb-Bar Length	Setting bar total length.	
LX-End Face Length	Setting the end face length.	
Length Divide	Length Divide	Divide the length of single bar equally. Only set N1 value; No end face cutting.
Length Not Divided	Length Not Divided	Setting each cutting length is available.
L1-Cut Length	Setting L1 cutting length.	
N1=	Set the numbers of L1 cutting length.	
L2-Cut Length	Setting L2 cutting length.	
N2=	Set the numbers of L2 cutting length.	
XX-Remain Material	Shown the remaining material length.	
*Length Divide	The button in Yellow color is function selected, cutting both side of end face isn't available; only need to set N1 (numbers of cutting pieces.) The button in Pink color is function unselected, cutting length is regarding to user's setting.	

*When program calculated the remain material length, wheel O.D is calculated into total bar length.

*Press the button on the up of right side, page will turn to “DATA Save and Download”.



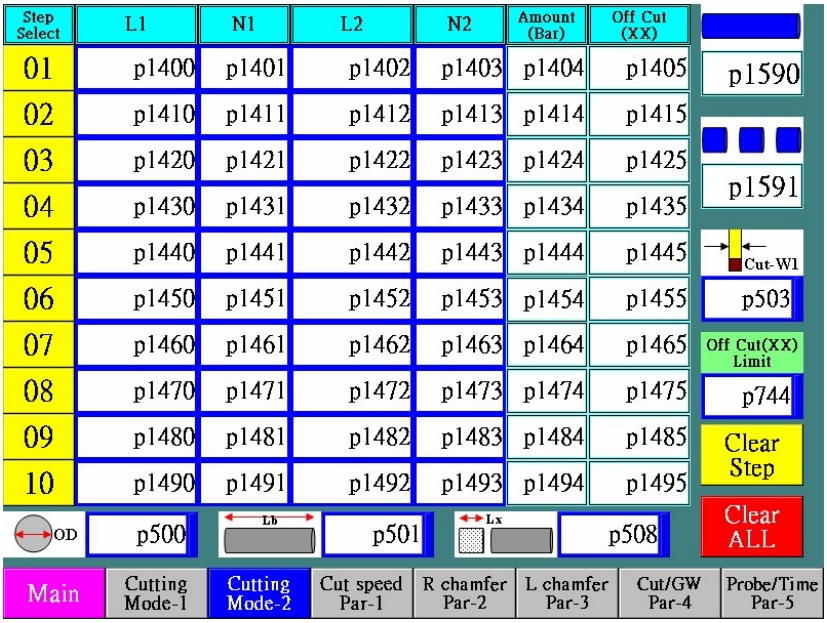


Function Description:

- Save HMI: Save all the process parameter.
- Save USB: Save all the process parameter to USB. (Insert the USB into backside of controller)
- Loading HMI: loading saved parameter.
- Loading USB: loading saved parameter from USB.

*Data saved included: Cutting Mode-1、R Chamfer Par-2、L Chamfer Par-3、Cut/GW Par-4、Probe/Time Par-5.

6.3.2-2 Cutting Mode-2



Cutting Mode-2

- A single bar can be set 2 different lengths in 10 combinations.
- Chamfer or no chamfer is selectable.
  (If select chamfer, all the chamfer shape needs to be the same in each combination.)
- Step Select: Each combination is selectable individually.
  (selected in yellow color button will be processed the procedure.)
- L1: Setting L1 cutting length.
- N1: Setting the numbers of L1 cutting pieces.
- L2: Setting last remaining length of single bar. (Recommend setting 1 piece to save off cut material.)
- N2: Setting the numbers of L1 cutting pieces.
- Amount (Bar): Shown the members of bar is in need of.
- Off cut (XX): Shown remaining length. (Do not over the remaining length)
- Cut-W1: setting wheel width.
- Off Cut Limit: Setting off cut length. (Do not set over length, recommend under 150mm.)
- BR: Setting bar diameter.
- LB: Setting bar length.
- LX: Setting end face length.
- Clear:



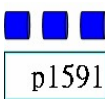
In red button is to clear all the combination cutting setting,



In yellow button is to clear selected combination cutting setting.

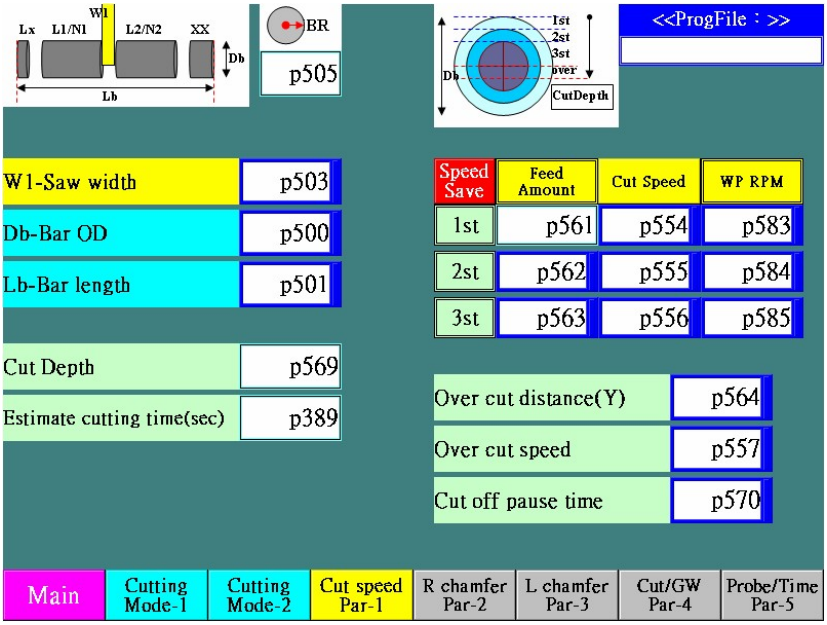


Shown the total bar is being cut.



Shown the total cutting pieces.

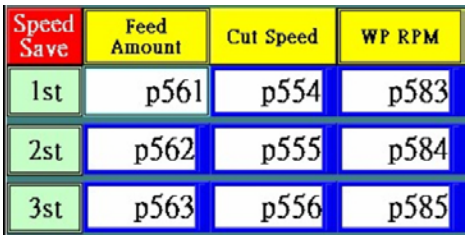
6.3.2-3 Cutting Speed Par-1



Setting 1 Cutting Data

Setting Bar and Saw

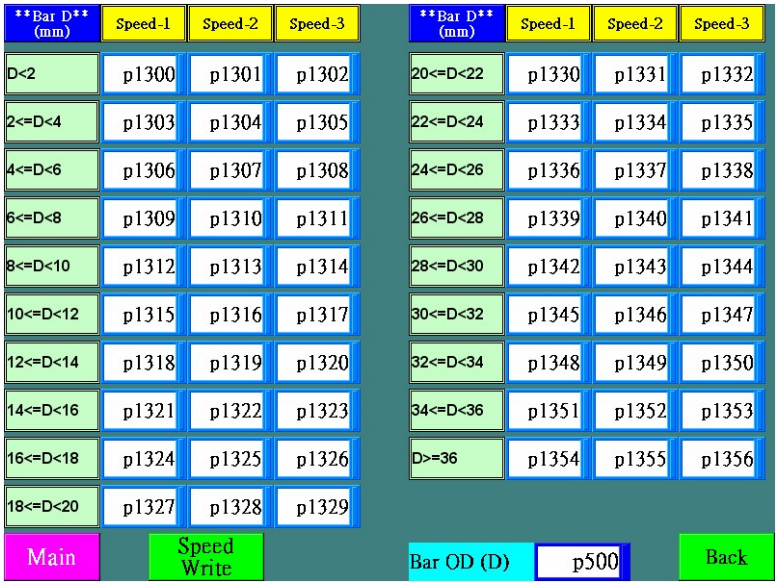
W1-Saw Width	Setting Saw width
Db-Bar O.D	Setting bar diameter
Lb-Bar Length	Setting bar total length
Cut Depth	Shown total cutting depth. (Included over cut distance.)
Estimate Cutting Time (Sec)	Estimate the cutting time.
Over Cut Distance (Y)	Setting over cutting distance from bar center.
Over Cut Speed	Setting cutting speed after cutting over the bar center.
Cut Off Pause Time	Setting the pause time after being finished cutting.



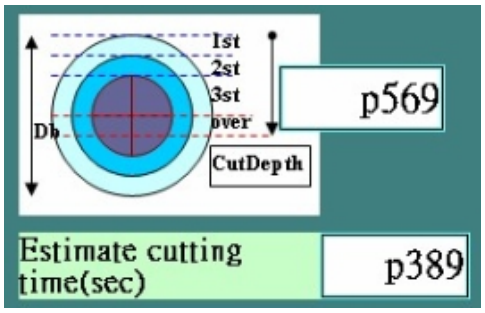
- Cutting has 3 kinds of feeding amount (Cutting movement.)
  *Recommend to average the feeding amount.
- Each cutting movement can set different speed.
  *Recommend slowly speed to fast speed.
- Each cutting movement can set different spindle speed.
  *Recommend setting WP RPM：400/400/400
- Speed Save: Save the process speed to the record list.

	Each cutting movement.	Cutting Speed	WP-RPM (Workpiece)
1st	1st cutting depth movement.	1st cutting speed	1st WP RPM
2 st	2nd cutting depth movement.	2nd cutting speed	2nd WP RPM
3 st	3rd cutting depth movement.	3rd cutting speed	3rd WP RPM

Cut Speed Press this button, screen turns to the list as shown as below.



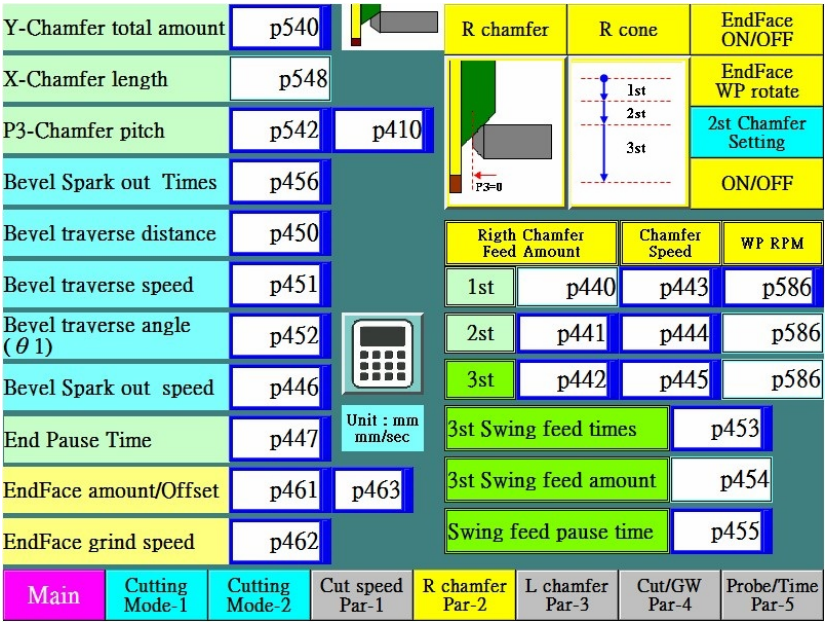
- If change the data of <Rod OD(D)>, the data of speed will be regarding to past record to enter into “cutting speed” on page <Cutting Par-1> automatically.



Shown the total cutting depth.

Shown the estimated time of cutting procedure.

6.3.2-4 R Chamfer Par-2



Setting Right Chamfer Parameter

Y Chamfer Total Amount	Setting Y axis chamfering amount.
X-Chamfer Length	Display X axis chamfering length.
P3-Chamfer Pitch/offset	Setting the touches position of bar and wheel when chamfering. /according to grinding result to compensate the setting. (Result：if the length is shorter, offset value enter “negative difference.”
Bevel Spark Out Times	Setting the times of bevel spark out.
Bevel Traverse Distance	Setting X axis bevel moving distance after reaching the setting depth.
Bevel Traverse Speed	Setting interpolated moving speed.
Bevel Traverse Angle θ 1	Setting interpolated angle.
Bevel Spark Out Speed	Setting spark out speed.
End Pause Time	Setting the end pause time for each process.
EndFace Amount/Offset	Setting the end face amount. / Over grinded distance offset (0.1~2mm)
EndFace Grind Speed	Setting the speed of end face process. (Recommend 0.02~0.06)

- Chamfering can be 3 different chamfering amount.

  *Recommend to average the chamfering amount.

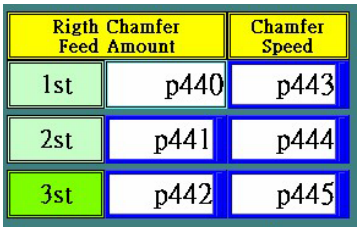
- Each chamfering amount can set different speed.

  *Recommend fast speed to slowly speed.

- Each chamfering amount can be 3 different RPM.

  *Recommend WP RPM are 1000RPM.

Right Chamfer Feed Amount		Chamfering Speed
1st	1st chamfering step depth	1st chamfering speed
2rd	2rd chamfering step depth	2rd chamfering speed
3nd	3nd chamfering step depth	3nd chamfering speed



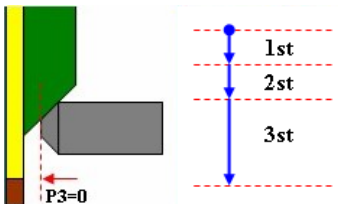


Select Chamfer or Cone function or both function off.

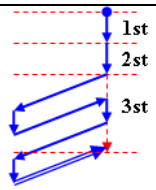
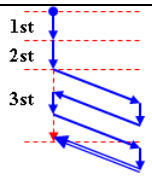


Function of End Face ON/OFF. (only under chamfering function, endface is available.)

- Select the button on right upon screen can change the chamfering mode. → → →



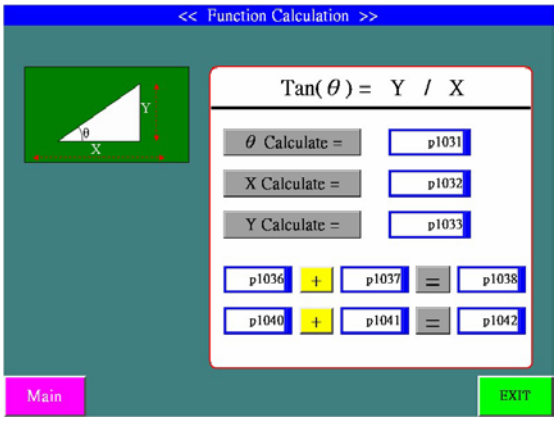
- Linear chamfering and interpolated chamfering can be selected shown as below

		
Right interpolated Selected	Not swing movement. (OEM setting)	Left interpolated Selected

- If select linear chamfering, when 3rd step chamfering is finished, the process of bevel interpolation and bevel spark will be acted upon.
- If select interpolated chamfering, when 2nd chamfering is finished, 3rd step chamfering will do interpolation and wheel feeding in.
- The data of interpolation and spark out are refereed to bevel traverse distance, those data are shared.
- Bevel spark out isn't acted if bevel spark time is set 0.
- If bevel traverse distance set 0, interpolation、spark out action and swing action will not be acted upon.

3nd Swing Feed Time	Setting the times of feeding in.
3nd Swing Feed Amount	Display single step of feeding amount. (3rd chamfering depth÷the times of swing feeding in.)
Swing Feed Pause Time	Action pause time.

***Function calculation:**



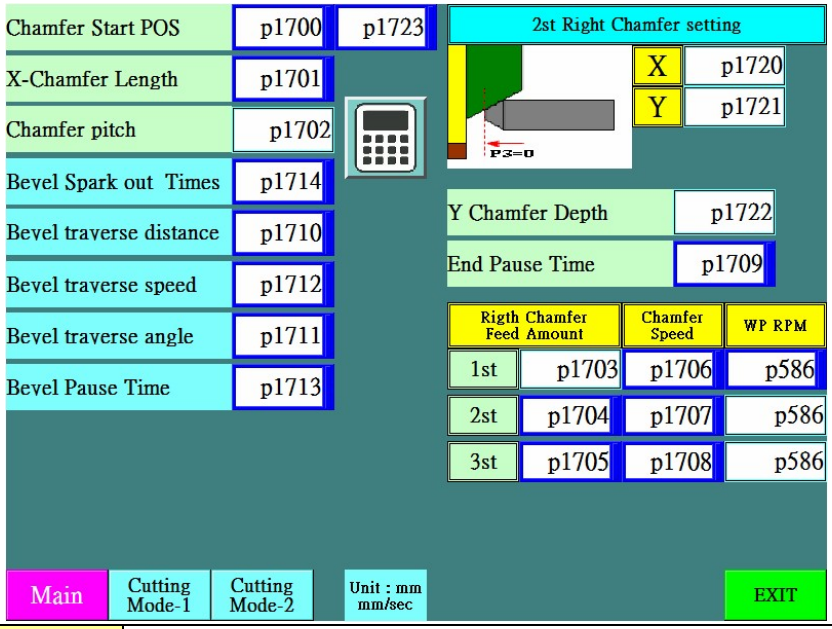
∗When press  on screen, page will turn to calculation function page.



Turn ON/OFF the function of 2nd chamfering mode, please refer to next chapter.

*This function only available under "cone" mode.

6.3.2-4.1 2nd Right Chamfering setting

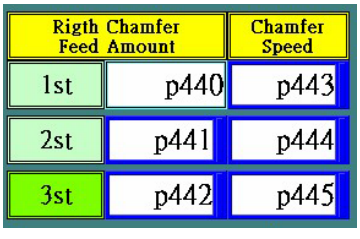


Chamfer Start POS/Offset	Setting (X) pre-point length. /according the result to offset the value. Result：if the chamfering amount is less than setting, enter "+ difference."
X-Chamfer Length	Setting (X) chamfering length.
Chamfer Pitch	Display the chamfering gap. (calculated by program.)
Bevel Spark Out Times	Setting the times of bevel spark out.
Bevel Traverse Distance	Setting X axis bevel moving distance after reaching the setting depth. (Recommended >X-Chamfer Length)
Bevel Traverse Speed	Setting interpolated moving speed.
Bevel Traverse Angle θ 1	Setting interpolated angle. (Setting the 2nd chamfering angel)
End Pause Time	Setting the end pause time for each process. (Recommended >0)

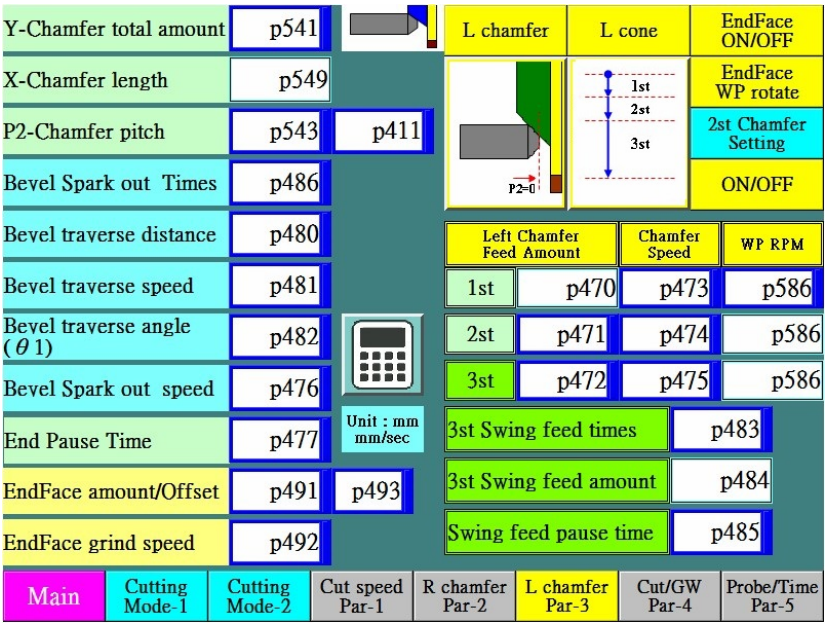
Y Chamfer Depth	Display Y chamfer depth. (calculated by program)
End Pause Time	Setting the end pause time. (>0)

- Chamfering can be 3 different chamfering amount.
  *Recommend to average the chamfering amount.
- Each chamfering amount can set different speed.
  *Recommend fast speed to slowly speed.
- Each chamfering amount can be 3 different RPM.
  *Recommend WP RPM are 1000RPM.

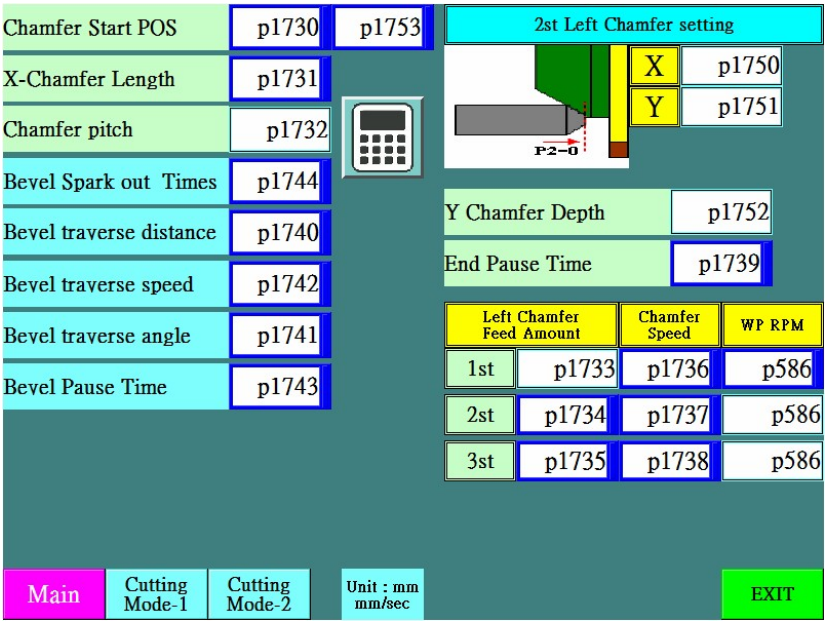
Right Chamfer Feed Amount		Chamfering Speed
1st	1st chamfering step depth	1st chamfering speed
2rd	2rd chamfering step depth	2rd chamfering speed
3nd	3nd chamfering step depth	3nd chamfering speed



6.3.2-5 L Chamfer Par-3

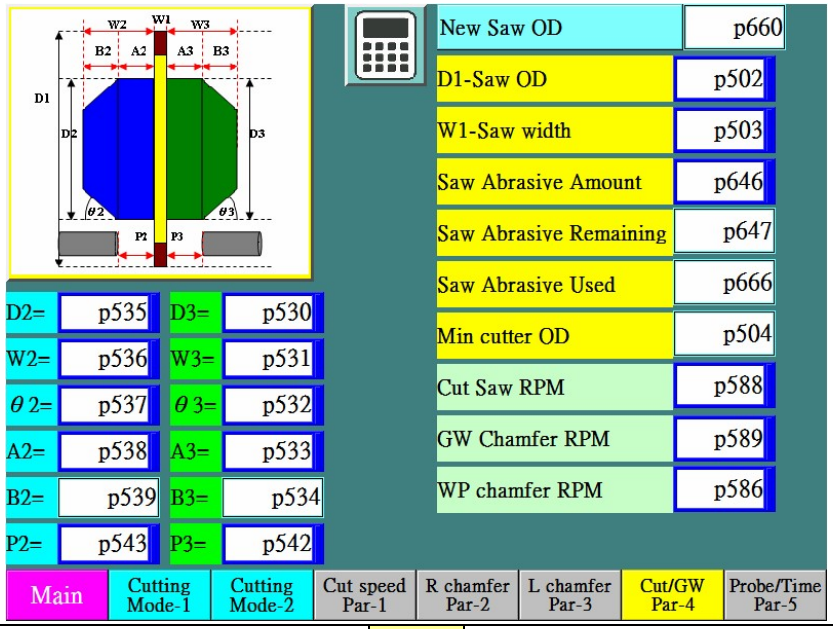


L Chamfer Par-3



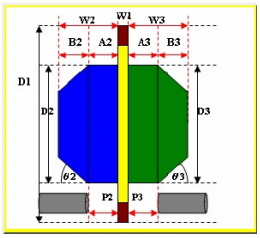
* All the data description refers to R Chamfer Par-2.

6.3.2-6 Cut/GW Par-4



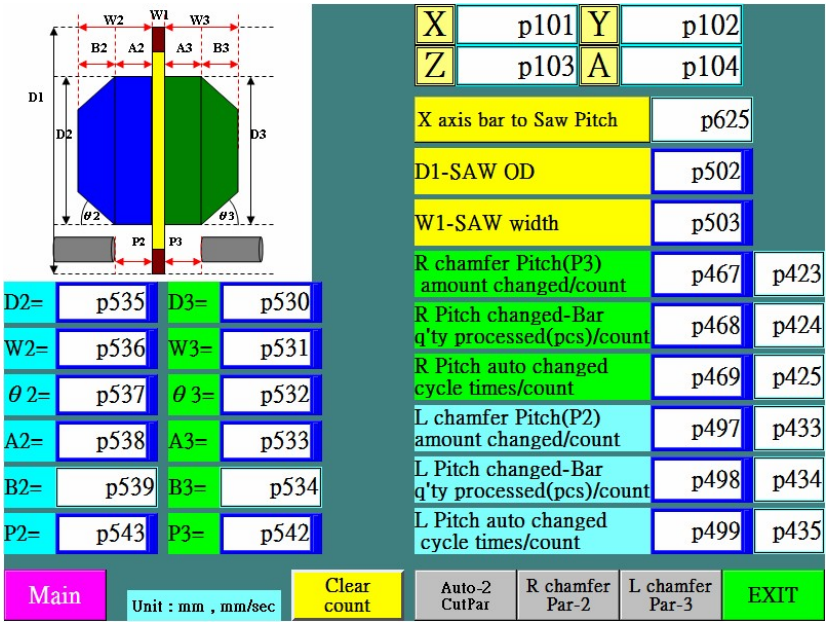
D2	The diameter of left chamfering wheel.	D3	The diameter of right chamfering wheel.
W2	The total wheel width of left chamfering wheel	W3	The total wheel width of right chamfering wheel
θ2	Left chamfering wheel angle	θ3	Right chamfering wheel angle
A2	Flat surface width of left chamfering wheel.	A3	Flat surface width of right chamfering wheel.
B2	Display the bevel width of left chamfering wheel.	B3	Display the bevel width of right chamfering wheel.
P2	The distance of bar and wheel when processing left chamfering.	P3	The distance of bar and wheel when processing right chamfering.

D1-Saw O.D	On page “Auto-4 (Function Option)” to press “cut probe on/off” to get the wheel outer diameter.
W1-Saw Width	Setting wheel width
Saw Abrasive amount	Setting the wheel of available wear amount.
Saw Abrasive Remaining	Display remaining available wear amount. When available wear amount is less than 0.5mm, machine will be alarmed. Procedure will be turned to cycle mode and stopped after current bar is done processed.
Saw Abrasion Used	Display wheel wore amount.
Mini Cutter O.D	Display wheel minimum O.D limited, wheel can’t be started if reach to minimum O.D limited.
Cut Saw RPM	Setting cutting wheel RPM. (Recommend 1000~1500RPM)
GW Chamfer RPM	Setting processing chamfering RPM. (Recommend 3000~3500RPM)
WP Chamfer RPM	Setting workpiece spindle RPM. (Recommend 1000RPM)



*When press the button on the screen, page will turn to “CutGW/Par-Pitch Parameter Setting”.

6.3.2-6-1 CutGW/Par-Pitch Parameter Setting



1	R/L Chamfer Pitch (P3/P2) amount changed/count	When setting the numbers of bar is done processing, pitch will be changed automatically. / shown currently P positon.
2	R/L Pitch changed-Bar q'ty processed (pcs) /count	Setting the distance of pitch will be changed automatically after the numbers of bar is done processing. / shown currently numbers of bar. (If zero is set, the pitch function will be OFF, if over zero, the function will be ON.)
3	R/L Pitch auto changed cycle times /count	Setting cycle times / shown currently cycle times. Definition per cycle: the setting numbers of bar is done processing, pitch is moved automatically until the wheel touch position is at the 0.5mm before end of wheel bevel as a cycle, then the pitch will move back from the beginning of wheel bevel, which count 2nd cycle. (Zero is set to OFF cycle function, Over zero is ON cycle function until the numbers of cycle times is done.)

Note：

*"R/L Pitch Changed-Bar q'ty processed (pcs) /count" button setting zero is OFF the pitch function.

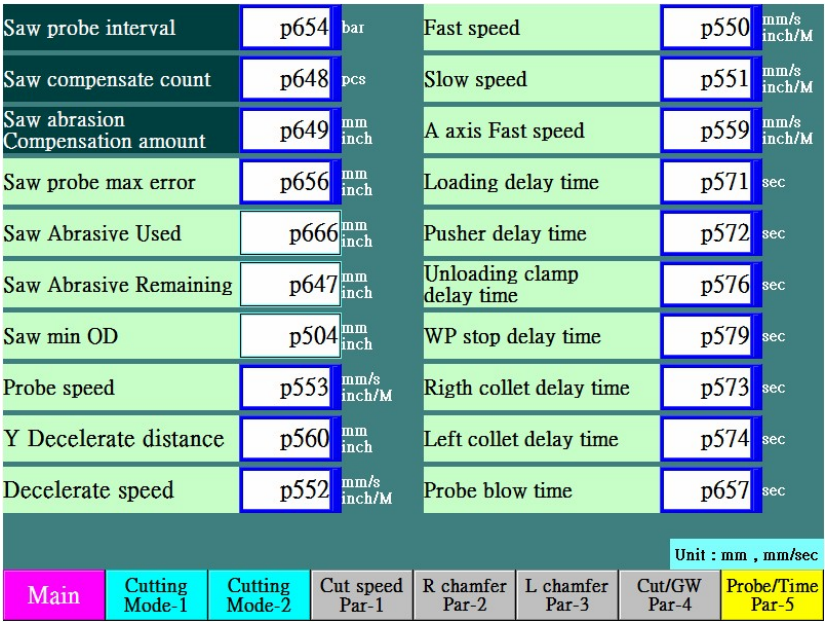
*"R/L Pitch auto changed cycle times /count" Button setting zero is only OFF the cycle function, but the pitch changing automatically function is still ON.

*Before numbers of cycle setting is at the last cycle processing, the screen will show alarm "wheel last cycle times" to inform operator, the operator press OK to exit the alarm screen.

*Operator press "start cycle" button, cycle times counting will restart running the cycle times until cycle times is approached.

*When pre-point function (cone) is ON, pitch changing automatically function will be automatically OFF and unable to be used.

6.3.2-7 Probe/Time Par-5



Probe/Time Par-5

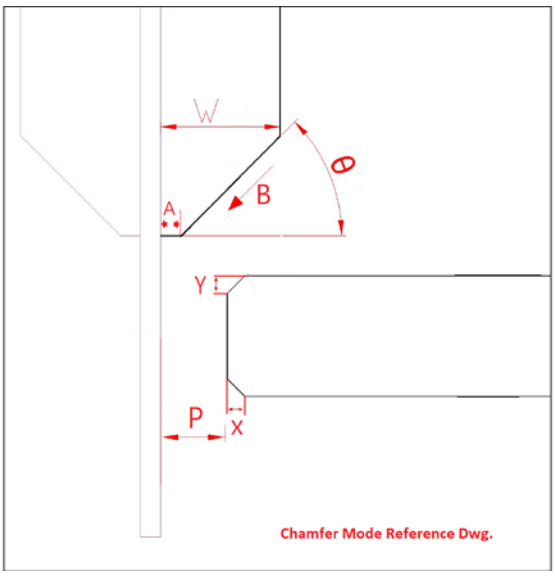
Saw Probe Interval	When numbers of finished bar is done process, the wheel will be probed.
Saw Compensate Count	Numbers of bar are finished to do probe wheel.
Saw Abrasion Compensation Amount	Saw compensates the amount automatically.
Saw Probe Max Error	Setting the max. tolerance.
Saw Abrasion Used	Display wheel available wear amount.
Saw Abrasive Amount	Display wheel remaining available wear amount.
Saw Mini OD	Display wheel minimum O.D.
Probe Speed.	Setting X axis moving speed when doing probe.
Y Decelerate Distance	Setting the buffer distance when saw is approaching to the bar. (Recommend 2~3)
Decelerate Speed	Setting the buffer speed. (Recommend 0.1~0.15)

Fast speed	Setting Y axis forward and backward speed when wheel is approached to the bar..
Slow speed	The short distance speed when wheel is going to do chamfering after cutting.
A-axis fast speed	A axis fast moving speed setting.
Loading Delay Time	It's an interval time between bar get into the V block and pusher pushing in.
Pusher Delay Time	It's an interval time between bar being pushed in by pushing cylinder and gripped by right collect.
Unloading Clamp Delay Time	After unloading gripper is processed, a delay time for processing the next action.
WP Stop Delay Time	When WP spindle is about to stop, setting the delay time to let the collect open and prevent from collet being open before WP spindle stopped.
Right (B axis) Collet Delay Time	Setting the delay time to make sure the right collect (B axis) has enough time to completely open or close.
Left (C axis) collet Delay Time.	Setting the delay time to make sure the left collect (C axis) has enough time to completely open or close.
Probe Below Time	Setting the blowing time when doing wheel probe.

6.3.2-8 Chamfer、Pre-point、Pre-point W/ Flat、2 Step Pre-point Setting Example

8-1 Chamfer parameter setting reference.

Page：Cut/GW Par-4 unit：mm		
Item	Deception	Note
D	Wheel OD	
W	Wheel Width	
θ	Wheel Angle	
A	Wheel Flat Length	
B	Wheel Bevel Length	Program Calculated
P	Pitch between Cutting Wheel & Bar	P >A
Note：*P value is the position of bar corner touches wheel, when grinding chamfer, P value must be over than A value.		



Page：R Chamfer Par-2 / L Chamfer Par-3		
Item	Description	Note
Mode	Chamfer ON	Chamfer mode ON.
Y Chamfer Total Amount	Y	Setting chamfer amount of Y axis (Value changeable.)
X-Chamfer Length	X	Program caudated refer to wheel angle.=X distance.
P2-Chamfer Pitch	P	Value between wheel width (W) and wheel flat width. (A)
Bevel Spark Out Times	0	Setting zero, off the bevel spark out function.
Note：*When OFF bevel spark out function, relative function such as bevel traverse distance, speed, angle and end pause time will all be OFF.		

*Note：By compensating to reach the requirement of chamfering amount.

*According to exactly chamfering amount, compensation method：(page：Cut/GW Par-4)

1. Offset the wheel O.D：what if to increase the chamfering amount, reduce the wheel diameter (D), vice versa.

   Ex：45 degrees, setting 0.5mm (Y) chamfering amount, the result is 0.3mm (Y), less 0.2mm chamfering amount.

   Offset the wheel O.D：(D)250mm (preset) – (0.2*2=0.4mm) = 249.6mm

   Note：when offset the wheel O.D, the difference value needs to be multiply by 2.

2 Offset the length of the wheel flat (A)：what if increase the chamfering amount, increase the length of wheel flat (A), vice versa.

   Ex：45 degrees, setting 0.5mm (Y) chamfering amount, the result is 0.3mm (X), less 0.2mm chamfering amount.

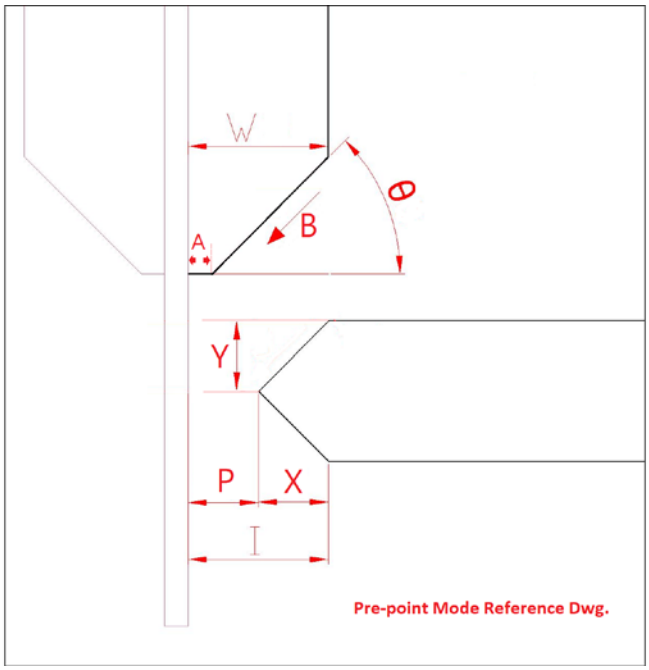
   Offset the wheel flat (A)：2mm (according to exactly flat length) +0.2mm=2.2mm

   Note：when offset the length of wheel flat (A), directly subtract the different value.

8-2 Pre-point parameter setting reference

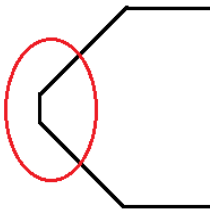
*Before Pre-point processing, use chamfer mode to compensate the wheel OD.

Page：Cut/GW Par-4 unit：mm		
Item	Deception	Note
D	Wheel OD	
W	Wheel Width	
θ	Wheel Angle	
A	Wheel Flat Length	
B	Wheel Bevel Length	Program Calculated
P	Pitch between Cutting Wheel & Bar	P >A
Note： *P value is the position of bar corner touches wheel, when grinding pre-point, P value must be over than A value.		



Page：R Chamfer Par-2 / L Chamfer Par-3		
Item	Description	Note
Mode	Cone ON	Cone mode ON.
Y Chamfer Total Amount	Y	Program calculated radius refer to bar diameter. (Value unchangeable.)
X-Chamfer Length	X	(Program calculated)=X distance
P2-Chamfer Pitch	P	P value between wheel width (W) and wheel flat width. (A)
Bevel Spark Out Times	0	Setting zero, bevel spark out function.
Note： *When OFF bevel spark out function, relative function such as bevel traverse distance, speed, angle and end pause time will all be OFF. * (Pitch + X Length) must less than W (wheel total width)		

*Grinding Result：If end of pre-point has flat shape, by using compensation method to adjust it.



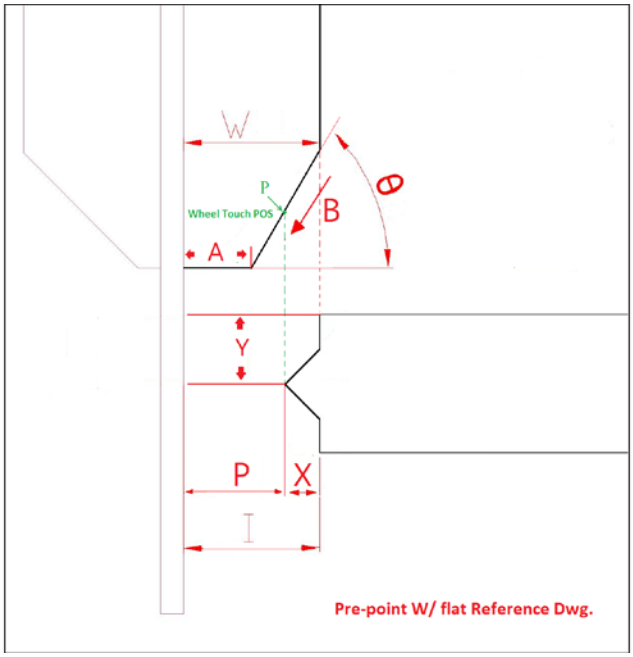
8-3 Pre-point W/ Flat setting reference

*Before Pre-point processing, use chamfer mode to compensate the wheel OD.

Page：Cut/GW Par-4 unit：mm		
Item	Deception	Note
D	Wheel OD	
W	Wheel Width	
θ	Wheel Angle	
A	Wheel Flat Length	
B	Wheel Bevel Length	Program Calculated
P	Pitch between Cutting Wheel & Bar	W-X=P

Note：

*P value is the position of bar corner touches wheel, when grinding pre-point w/ flat, P is (W) wheel total width subtract X distance.



Page：R Chamfer Par-2 / L Chamfer Par-3		
Item	Description	Note
Mode	Cone ON	Cone mode ON.
Y Chamfer Total Amount	Y	Program calculated radius refer to bar diameter. (Value unchangeable.)
X-Chamfer Length	X	(Program calculated)=X distance
P2-Chamfer Pitch/offset	P	P =W (wheel width) – X (X distance) Result：X value shorter than setting, offset “negative value.”
Bevel Spark Out Times	0	Setting zero, bevel spark out function.

Note：

*When OFF bevel spark out function, relative function such as bevel traverse distance, speed, angle and end pause time will all be OFF.

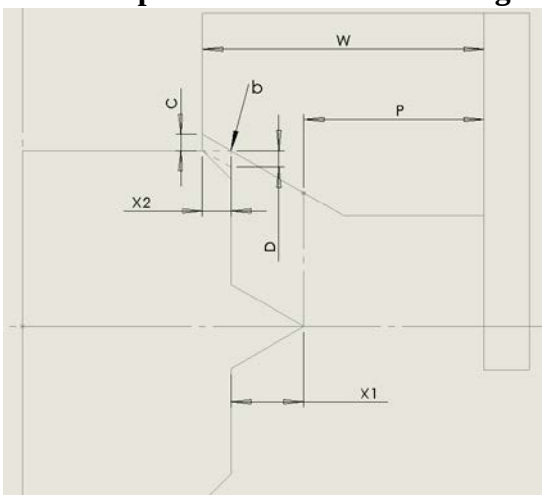
*I length must be equal W (wheel width).

*P value minimum setting is 0.5mm.

*Grinding Result：Measuring X length (Pre-point length), if less or over than requirement, adjust P value.

(X length less→P－Difference value；X length over→P＋Difference value)

8-3-1 Pre-point W/ Flat + chamfering setting reference



W：Wheel thickness.

C & D：Y Chamfer Depth (45 degrees, C & D are the same data)

b：Wheel and bar touch position.

P：pitch

X1：pre-point X length

X2：Chamfering X length.

Page：R Chamfer Par-2 / L Chamfer Par-3		
Item	Description	Note
Mode	Cone ON	Cone mode ON.
Y Chamfer Total Amount	Y	Program calculated radius refer to bar diameter(Value unchangeable.)
X-Chamfer Length	X	(Program calculated)=X distance
P2-Chamfer Pitch/offset	P	P =W (wheel width) – X (X distance) Result：X value shorter than setting, offset “negative value.”
Bevel Spark Out Times	0	Setting zero, bevel spark out function.

Item	Description	Note
Chamfer Start POS/offset	X1	Setting X1 pre-point length. Result：chamfer length is shorter than setting, enter “+ difference value”
X-Chamfer Length	X2	Setting X2 chamfering X length.
Chamfer Pitch	P	Calculated by program.
Bevel Spark out Times	1	>0
Bevel Traverse distance	>X2	>X axis chamfering length
Bevel Traverse speed	0.2	
Bevel Traverse angel θ	45	Chamfering angel
Bevel Traverse time	1	>0
Y Chamfer Depth	D	Calculated by program.
End Pause Time	1	>0

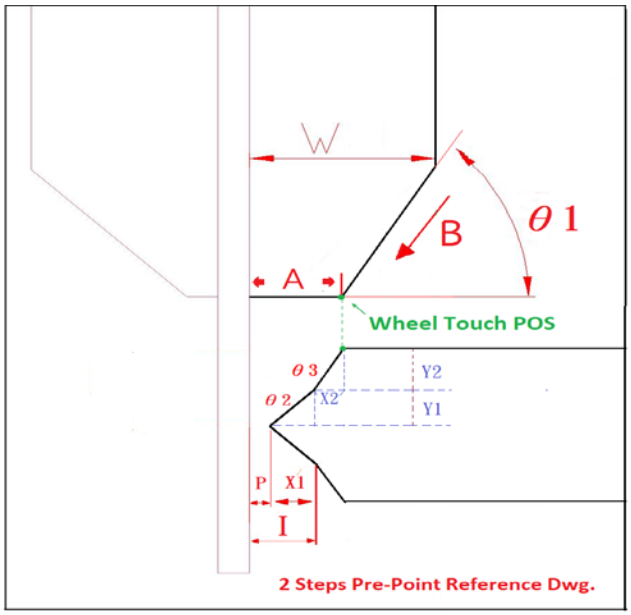
*Note：

1. Wheel angel must be smaller than chamfering angel.
2. The angel of chamfering wheel and pre-point are the same.
3. The bevel length of the wheel must be longer than pre-point (X) length.
4. If the both angles are the same, “Bevel Traverse angel” sets zero to use the bevel side to grind it.

8-4 Two steps pre-point setting reference.

*Before Pre-point processing, use chamfer mode to compensate the wheel OD.

Page：Cut/GW Par-4 unit：mm		
Item	Deception	Note
D	Wheel OD	
W	Wheel Width	
θ	Wheel Angle	
A	Wheel Flat Length	
B	Wheel Bevel Length	Program Calculated
P	Pitch between Cutting Wheel & Bar	A-X=P
Note：*P value is the position of bar corner touches wheel, when grinding 2 steps pre-point, P value is exactly flat length (A) subtract X length.		

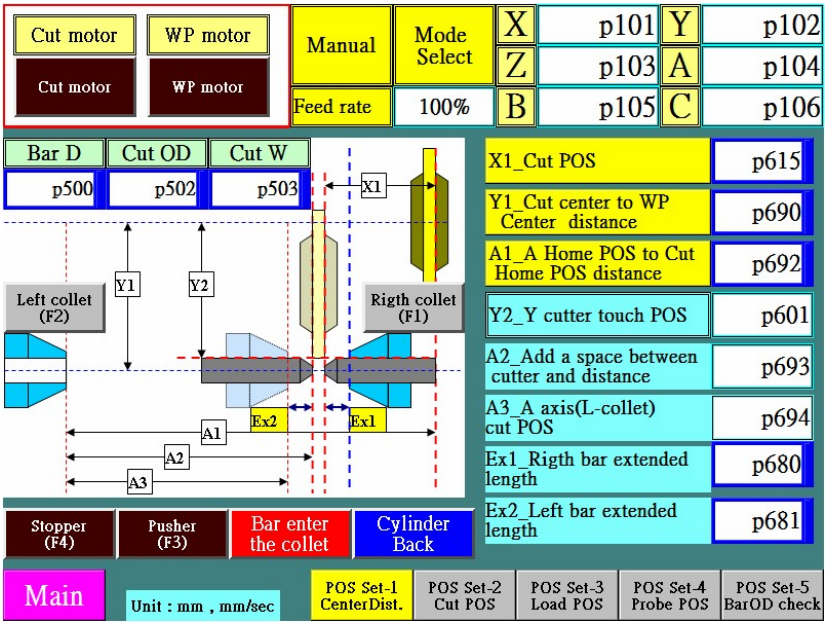


Page：R Chamfer Par-2 / L Chamfer Par-3		
Item	Description	Note
Mode	Chamfer ON	Chamfer mode ON.
Y Chamfer Total Amount	Y2	Y2 chamfer amount.
X-Chamfer Length	X	(Program Calculated)= X1+X2 length
P2-Chamfer Pitch	P	Exactly wheel flat length (A) subtract (X1) length=P
Bevel Spark Out Times	1	>0
Bevel Traverse Distance	>X1	>X1 length
Bevel Traverse Speed	0.1	Recommend 0.1~0.3
Bevel Traverse Angle θ 1	θ 2	1st Pre-point angle
Bevel Spark Out Speed	0.1	Recommend 0.1~0.3
End Pause Time	2	Recommend 1~2 sec
Note：*According to X1 length requirement to calculate Y1 value by trigonometric function；And calculate Y2 value. *Y2 (θ3) angle and wheel angle (θ1) must be the same. * P value minimum setting is 0.5mm. *I length must equal or less than (A) wheel flat length. *θ2 angle must be smaller than θ3.		

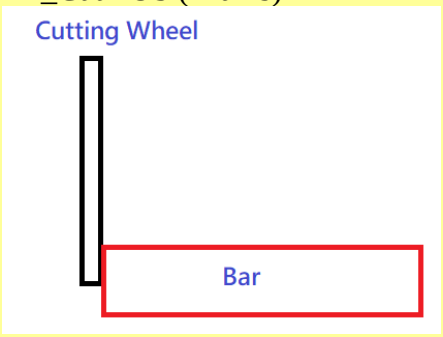
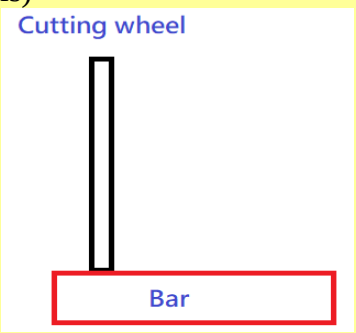
*Grinding Result：Y1 Value less or over the requirement, by compensating to adjust Y1 value.
X1 length is shorter or longert than requirement, by changing the P value to ajdustingX1 length.

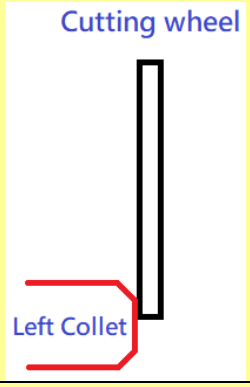
6.3.3 Processing Position Setting

6.3.5-1 POS Set-1 Center Dist.



POS Set-1 Center Dist.

X1_Cut POS (X axis) 	**Function:** Setting X axis cutting position. **Method:** ***Must set the exactly wheel dimeter.** 1. Put 1 bar into V block, enter bar diameter. 2. Press the button of "Bar Enter the Collet" to let the bar pushed into collet and tighten up. 3. Rotate the hand wheel to move the wheel until right side touches off the bar. 4. If both touch off, press "X1_Cut POS" to enter X axis position. *Before setting, wheel O.D and bar O.D must be corrected. *When changing the bar OD, operator needs to reset or verify the X1_Cut POS.
Y1_Cut Center to WP Center Distance (Y axis) 	**Function:** Setting the center position between wheel and bar. **Method:** ***Must set the exactly wheel dimeter.** 1. After setting X1_Cut POS, move the wheel to side of bar. 2. Use hand wheel to move the wheel touch off the bar surface. 3. Press "Y1_Cut Center to WP Center Distance "to set it. *When changing the new wheel, enter new wheel OD and press "New Cut Probe Test" to set it. If the new wheel OD is the same as previously setting, it's not necessary to reset it. *If operator only change the bar OD, and use the originally wheel, it's not necessary to reset it. *Y1_Cut center to WP center is based on new wheel OD to teach the wheel. *If use the old wheel to set the Y1 cut center to WP center, do "Old Cut Probe Test" to let the program detect the old wheel OD, and then teach the wheel.

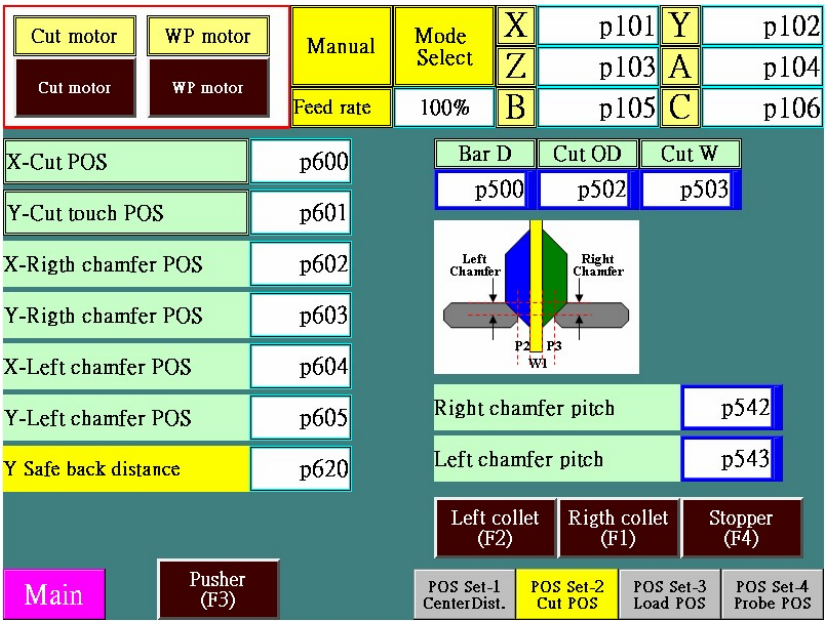
A1_A Home POS to Cut Home POS Distance.  	**Function:** Setting the distance of A axis home position to Wheel home (X axis) position. **Method:** 1. Use hand wheel to move C axis to touch off the left side of wheel. 2. Press "A1_A Home POS to Cut Home POS Distance" button to set it. *OEM Setting and not necessary to change it.
Y2_Y Cutter Touch POS	Display the bar and wheel touch position.
A2_A axis (L-Collet) to Left Cutter Distance	Display the distance from wheel of left side to left of collet.
A3_A axis (L-Collet) Cut POS	Display the A axis position when cutting off.
Ex1_ Right Bar Extended Length	Setting the bar pushed into right collet and stopped by the stopper, the bar exposed length.
Ex2_Left Bar Extended Length	Setting the left collet exposed length when cutting off.

Note:

*Before teaching the "New wheel", press "New Cut Probe Test" button to detect the new wheel OD.

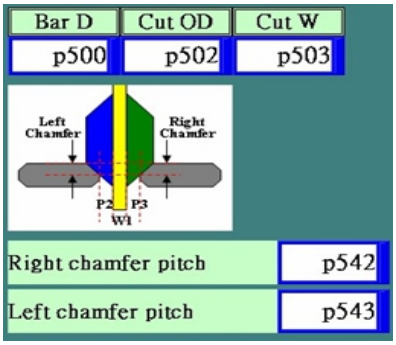
*Before teaching the "Old wheel", press "Old Cut Probe Test" button to detect the old wheel OD.

6.3.3-2 POS Set-2 Cut POS



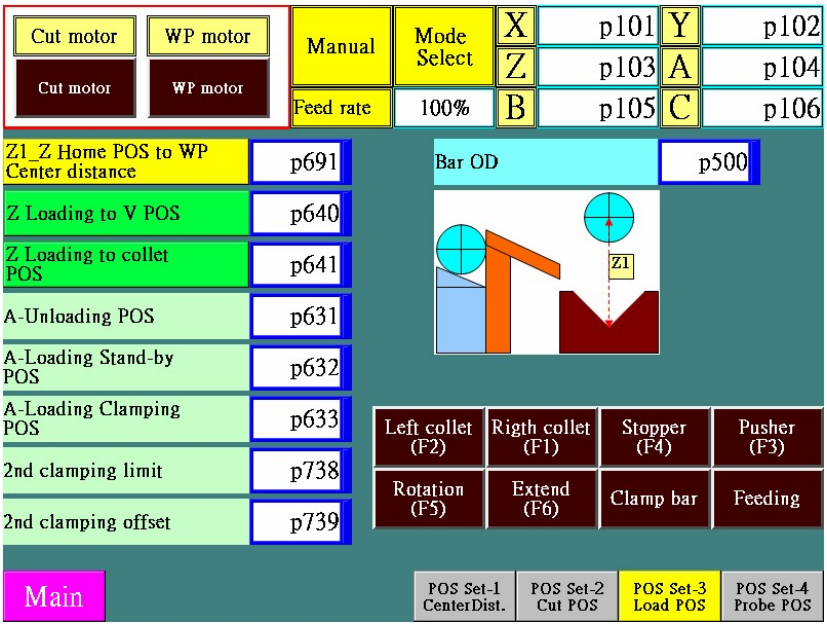
POS Set-2 Cut POS

1	X-Cut POS	X axis position when cutting.
2	Y-Cut Touch POS	The touching position between bar and wheel.
3	X-Right Chamfer POS	X axis position when processing right chamfering.
4	Y-Right Chamfer POS	Y axis position when processing right chamfering.
5	X-Left Chamfer POS	X axis position when processing left chamfering.
6	Y-Left Chamfer POS	Y axis position when processing left chamfering.
7	Y Safe Back Distance	Setting Y axis moves back to safety position when exchanging the material.



1	Bar D	Setting bar diameter.
2	Cut OD	Setting wheel diameter.
3	Cut W	Setting wheel width. *Recommend when setting wheel width, plus 0.02mm from exactly wheel width. *If cutting length has an error, change the wheel width to correct the cutting length.
4	P3 Right Chamfer Pitch	The distance from bar end face to wheel when processing right collet chamfering.
5	P2 Left Chamfer Pitch	The distance from bar end face to wheel when processing left collet chamfering.

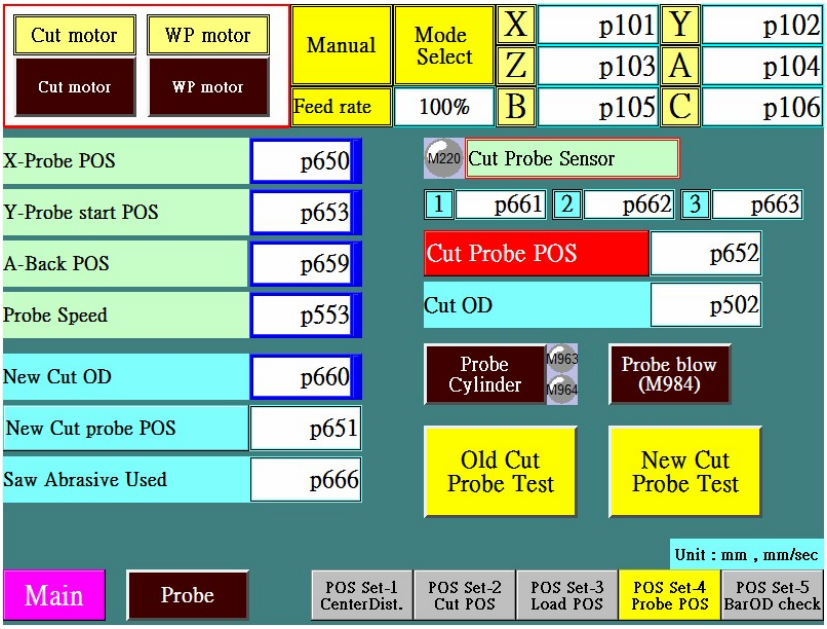
6.3.3-3 POS Set-3 Load POS



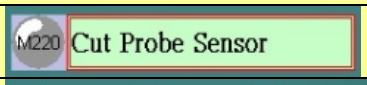
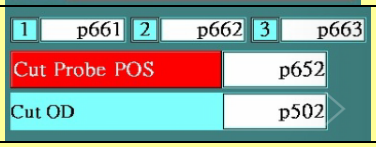
POS Set-3 Load POS

1	Z1 Z Home POS to WP Center Distance	Setting the distance from bottom of V block to Center of B axis. Method: 1. Put a bar on the V block (bar size need to fit the collect size). 2. Set the bar O.D. 3. Move Z axis to let the bar move into the guide sleeve by manually. 4. Setting the distance from Z home position to center of bar. *OEM Setting, if the value is error, it's necessary to reset it.
2	Z Loading to V POS	Setting Z axis of height position when processing bar loading. *OEM Setting: 15mm.
3	Z Loading to Collect POS	Setting Z axis of height position when bar, which is on the V block, is pushed into collect. *Program set automatically after setting "Z1 Home POS to WP Center Distance".
4	A-Loading to Collet POS	Setting A axis holding position when loading cylinder is action. **OEM Setting
5	A-Loading Stand-by POS	Setting A axis is waiting for loading position when loading the bar. *OEM Setting
6	A-Loading Clamping POS	Setting the position where A axis gets the bar from B axis collet when finishing the loading. (*OEM Setting, not necessary to reset it)
7	2nd Clamping Limit	Setting the maximum length. It's 2 times loading automatically when if the bar length is over maximum length. *OEM Setting
8	2nd Clamping Offset	When loading 2 times, the distance of A axis offset moving. *OEM Setting (Preset:0)

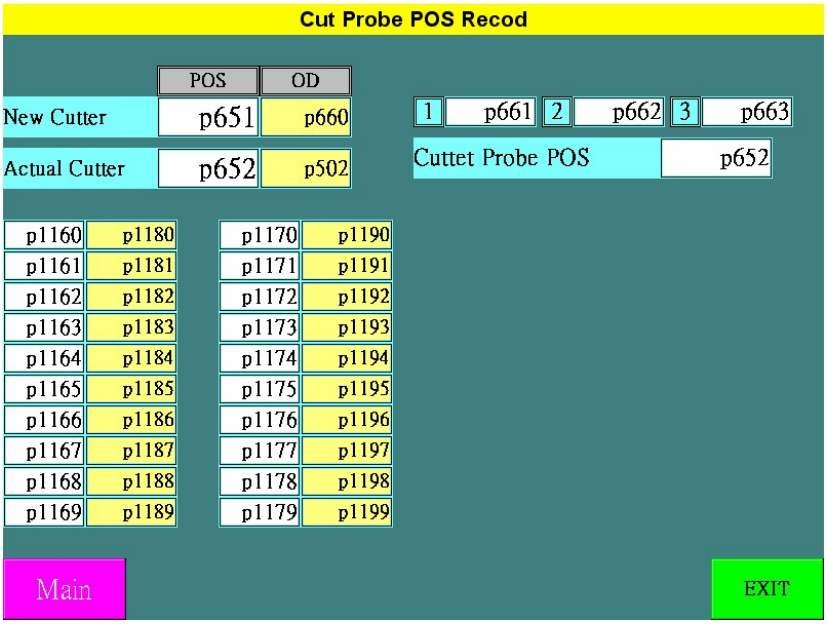
6.3.3-4 POS Set-4 Probe POS



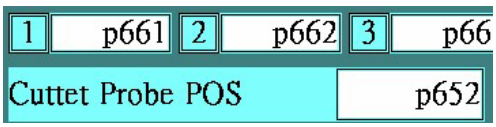
POS Set-4 Probe POS

1	X-Probe POS	The X axis positon when processing wheel probe. (About 2~3mm) *OEM Setting
2	Y-Probe Start POS	The Y axis start positon when processing wheel probe. *OEM Setting
3	A-Back POS	The A axis returning back position when processing wheel probe. *OEM Setting (Preset:0)
4	Probe Speed	Table moving speed when processing wheel probe. *OEM Setting (Recommend 2~4 sec)
5	New Cut OD	Enter the new wheel's outer diameter.
6	New Cut Probe POS	Y axis position is probed by new wheel.
7	Saw Abrasive Used	The abrasion of single side wheel is calculated after the new wheel is probed.
8		When wheel sensor is detected, M220 will turn to red color.
9		Display running 3 times detective positon Display average position after 3-time detection. Display the wheel O.D by detection.
10		1. **New Cut Probe Test:** **a.** Measuring exactly wheel O.D and enter the value into "New Cut OD" button. **b.** Press "New Cut Probe Test"→Mode Select turn to "AUTO"→press "Cycle Start" 2. **Old Cut Probe Test:** **a.** Press "Old Cut Probe" button→Mode Select turn to "AUTO" →press "Cycle Start"

Cut Probe POS *Press this button, page will turn to “Cut Probe POS Record”.



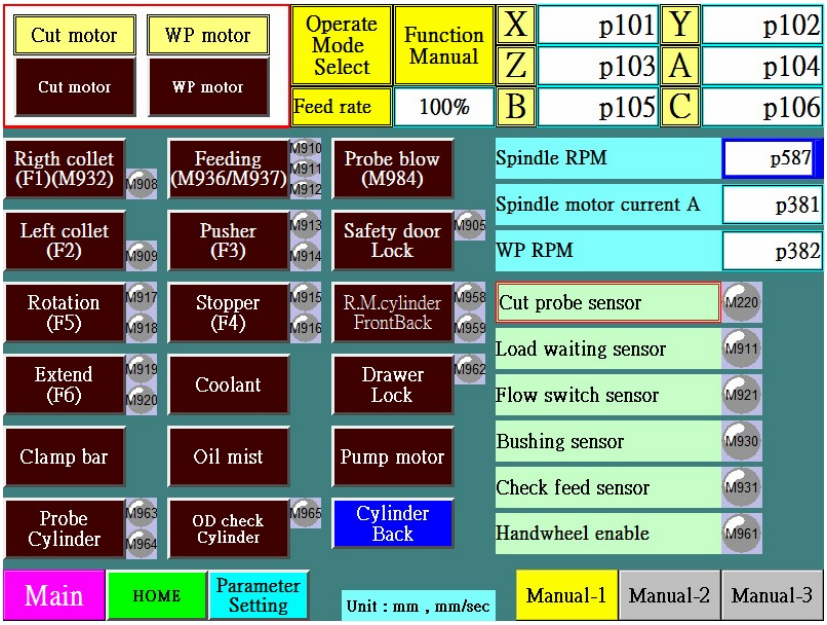
1. POS: White space shows deceive position.
2. OD: Yellow space shows wheel O.D detected.
3. There are 20 records of wheel detective.
4. New Cutter: Shows new wheel position and O.D.
5. Actual Cutter: Shows wheel is detected.



Shows last detected result.

6.3.4 Manual Mode

6.3.4-1 Manual-1



Manual-1

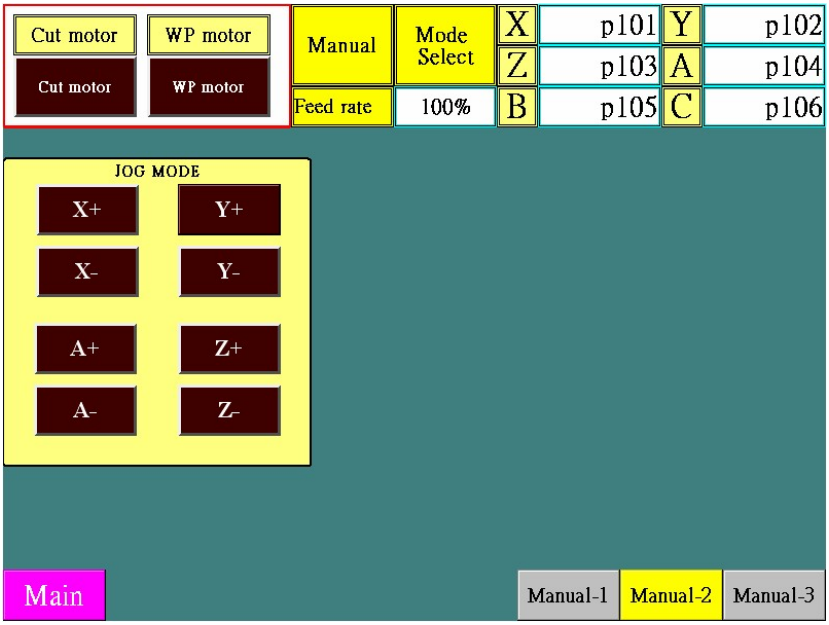
Cut Motor	ON/OFF wheel motor.	**WP Motor**	ON/OFF spindle of B axis and C axis (collets must be closed).
Right Collet (F1)	Right collet Open/Close	**Left Collet (F2)**	Left collet Open/Close
Rotation (F5)	Up/down gripper cylinder	**Extend (F6)**	Forward/backward the gripper cylinder
Clamp Bar	Gripper open / close	**Probe Cylinder**	Probe cylinder forward/backward
Feeding	Loading up/down/waiting	**Pusher (F3)**	Forward/backward pusher
Stopper (F4)	Forward/backward stopper	**Coolant**	Coolant motor ON/OFF
Oil Mist	Oil mist motor ON/OFF	**OD check cylinder**	O.D check cylinder up/down
Probe Blow	Probe blowing manually	**Safety Door**	Safety Door ON/OFF
R.M Cylinder FrontBack	Remaining material board up/down	**Drawer Lock**	Drawer Lock ON/OFF
Pump Motor	Pump motor ON/OFF	**Cylinder Back**	All cylinder return back

Cut Probe Sensor	The statement of saw probe sensor
Loading Waiting Sensor	The statement of loading waiting sensor
Flow Switch Sensor	The statement of flow switch sensor
Bushing Sensor	The statement of bushing sensor (guide sleeve)
Check Feed Sensor	The statement of loading sensor
Hand Wheel Enable	The safety button on hand wheel is ON/OFF

Home：Press this button to make all axis back to home position.

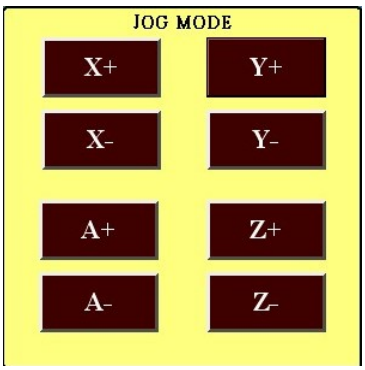
Parameter Setting：Press this button to turn the page to Cutting Mode-1.

6.3.4-2 Manual-2



Manual-2 JOG

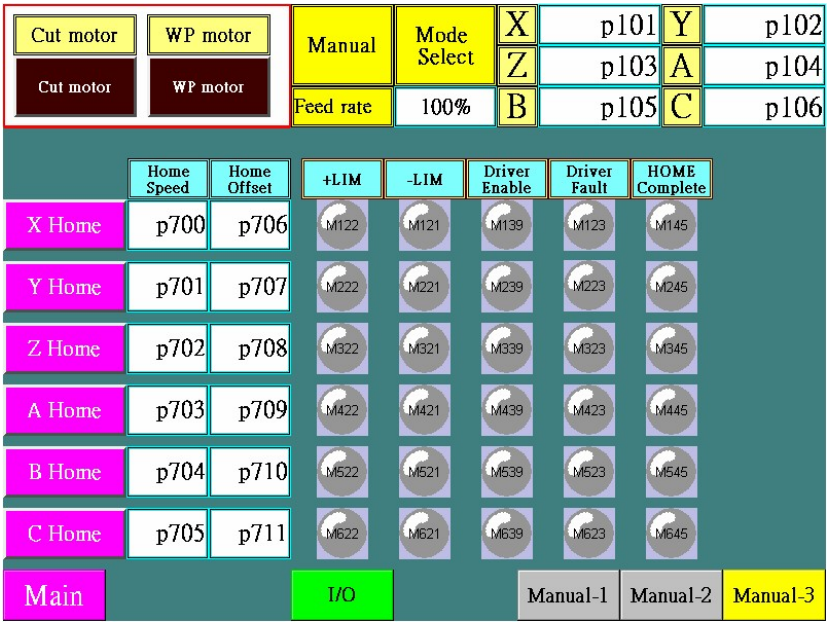
Axial Controller Button



●JOG MODE

X、Y、A、Z axis Jog button on HMI

6.3.4-3 Manual-3

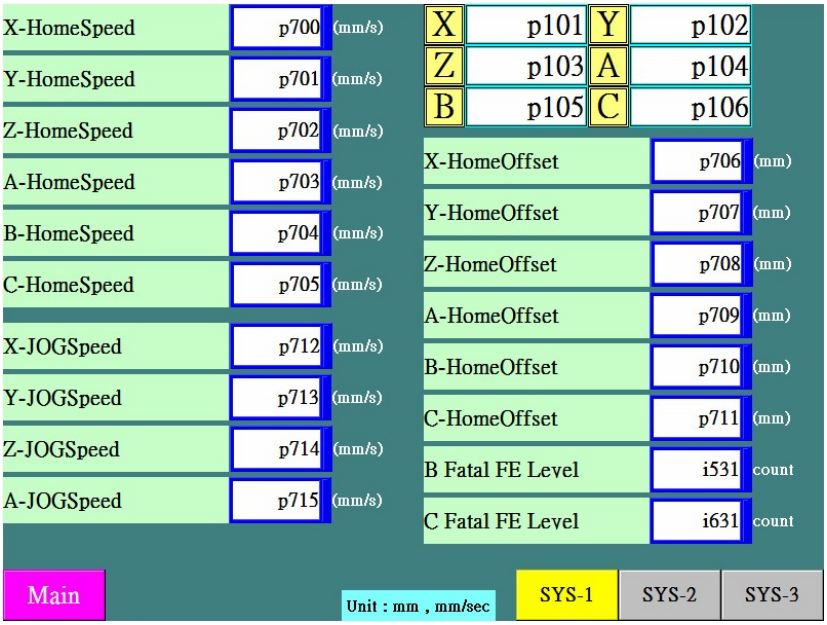


Manual-3 Display the statement of IO connection.

- IO connection introduction is according to Chapter 7.
- Any abnormal statement of all sensor can be monitored by “Manual-3”
- The buttons on left side in pink (Home) can be back to Home individually.
- Home speed: Display the speed of back to home.
- Home offset：Display the home offset.

6.3.5 System Setting (Password:89823631)

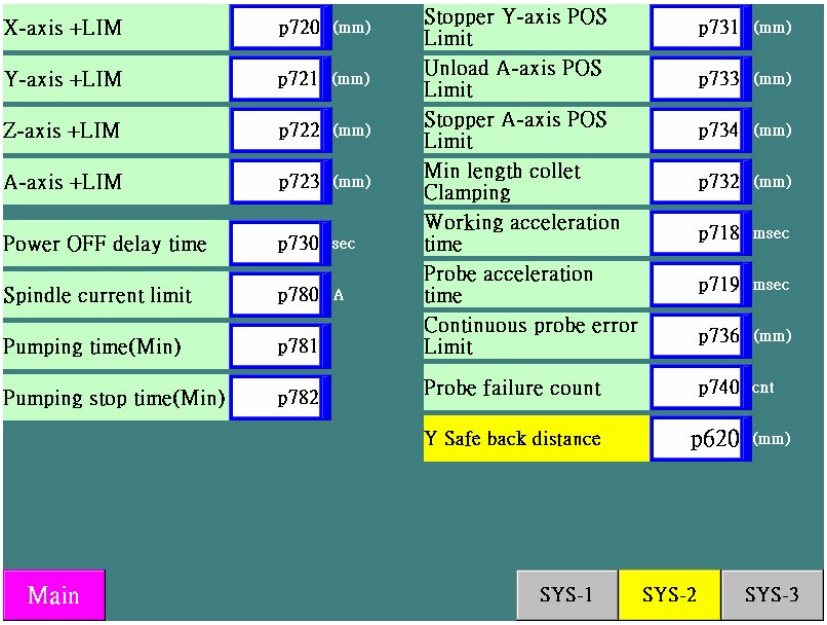
6.3.5-1 SYS-1



SYS-1

X Axis Home Speed	X axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
Y Axis Home Speed	Y axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
Z Axis Home Speed	Z axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
A Axis Home Speed	A axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
B Axis Home Speed	B axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
C Axis Home Speed	C axis moving speed when back to home.(Preset Value:20mm/sec; Recommdation Range:10~50)
X Axis Home Offset	The offset after X axis touches home stopper.
Y Axis Home Offset	The offset after Y axis touches home stopper.
Z Axis Home Offset	The offset after Z axis touches home stopper.
A Axis Home Offset	The offset after A axis touches home stopper.
B Axis Home Offset	The offset after B axis touches home stopper.
C Axis Home Offset	The offset after C axis touches home stopper.
X Axis JOG Speed	X moving speed when JOG moving (Preset Value:20mm/sec; (Range:10~50)
Y Axis JOG Speed	Y moving speed when JOG moving (Preset Value:20mm/sec; (Range:10~50)
Z Axis JOG Speed	Z moving speed when JOG moving (Preset Value:20mm/sec; (Range:10~50)
A Axis JOG Speed	A moving speed when JOG moving (Preset Value:20mm/sec; (Range:10~50)
B Fatal FE Level	The value of B axis following error. (Preset:10000; Range:2000~50000)
C Fatal FE Level	The value of C axis following error. (Preset:10000; Range:2000~50000)

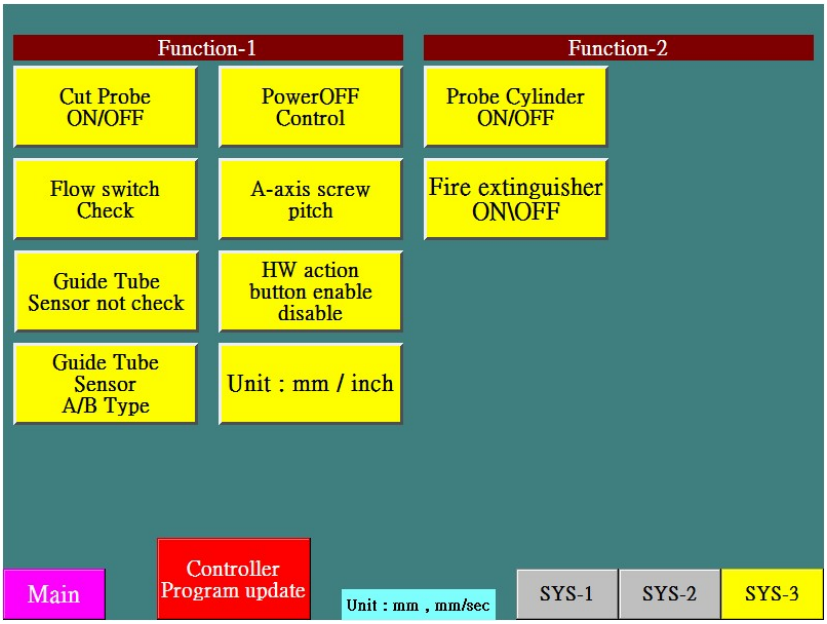
6.3.5-2 SYS-2



X-Axis (+LIM)	X Axis software + limited.
Y-Axis (+LIM)	Y Axis software + limited.
Z-Axis (+LIM)	Z Axis software + limited.
A-Axis (+LIM)	A Axis software + limited.
Power OFF Delay Time	When Power OFF automatically, after processing, current will be delay. (preset:10 sec)
Spindle Current Limit	If wheel spindle is over current, it will be alarmed. (preset:20A)
Stopper Y-Axis POS Limit	Before stopper is action, Y axis needs to be back after limited position. (preset:60mm)
Unload A-Axis POS Limit	Before loading arm cylinder is action, A axis needs to be back after limited position.(preset :180mm)
Stopper A-Axis POS Limit	Before stopper is action, A axis needs to be back after limited position. (preset : 400mm)
Min Length Collet Clamping	When dressing end face, if end face length is under limited length, right collect will be released, and gripped by left collet (preset:5mm)
Working Acceleration Time	To time speed up or down for the processing. (preset :200ms)
Probe Acceleration Time	X axis and Y axis of time speed up or down when processing wheel probe. (preset:50ms)
Continuous Probe Error Limit	If the continuous probe error is over limited, wheel will be re-detected.(preset : 0.5mm)
Probe Failure Count	It will be alarmed if the times of detecting wheel is failure. (preset: 3 times)

- If wheel detection can’t be processed, please clear the detective sensor and re-detected.

6.3.5-3 SYS-3



SYS-3

Function-1

1. Cut Probe ON/OFF: ON/OFF the wheel detective function.
2. Flow Switch Check: ON/OFF the flow detective function.
3. Guide Tube Sensor Not Check: ON/OFF guide tube sensor checking function.
4. Guide Tube Sensor A/B Type: Select A type (Normal Open) (Standard Setting) or B type (Normal Close) for the sensor.
5. Power OFF Control: ON/OFF power off control function.
6. A axis Screw Pitch 20 or 10mm: chose A axis screw rod distance. (Standard 10mm. Option :20mm)
7. HW Action Button Enable Disable: Turn On or Off the safety function of hand wheel.
8. Unit：mm/inch：unit changed function (after changing the unit, switch on/off the machine.)

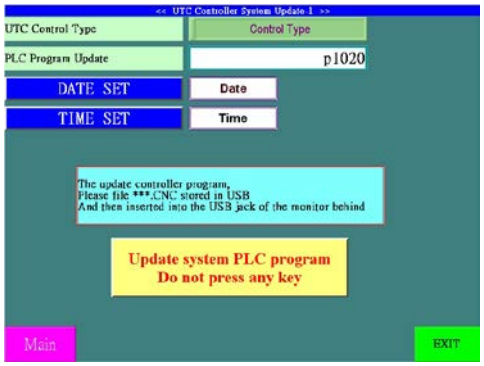
Function-2

1. Probe Cylinder ON/OFF：switch probe cylinder function.
2. Fire extinguisher ON/OFF：turn on/off this function. (this is a spare connection for connecting customer side’s fire extinguisher.)

*Controller Program Update: for program updating.



Press this button to turn to below page. (Password:89823635)

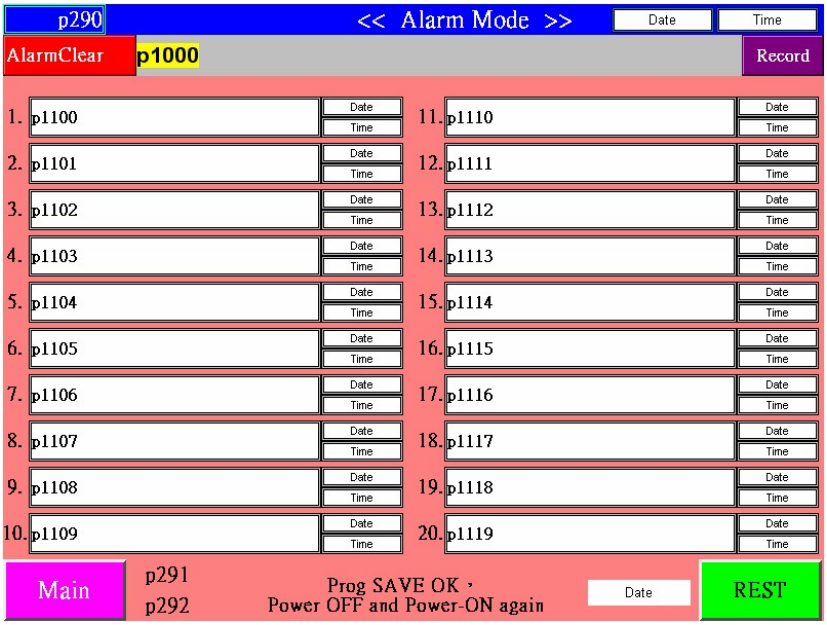


UTC Controller System Update-1

*File Name: NRCC-XXXX-XX.CNC

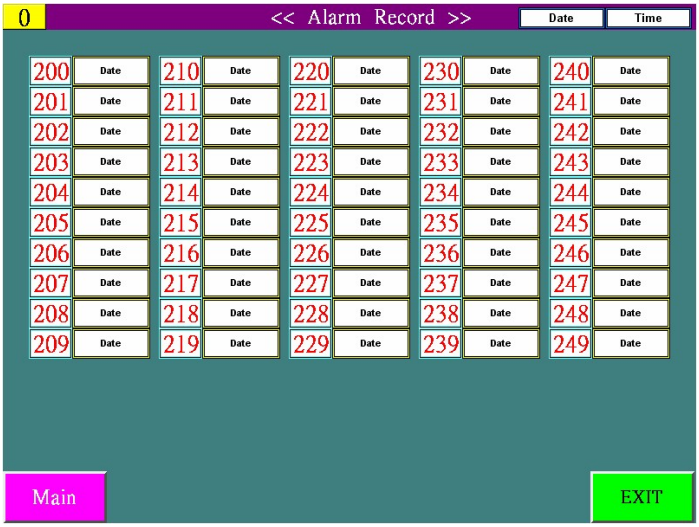
6.3.6 Alarm Mode

6.3.6-1 Alarm Mode



Alarm Mode

1. Displayed current abnormal condition.
2. It’s able to record the first 20 times abnormal message、date and time.
3. Press this button to clear the records. Alarm Clear



*Record the alarm.

6.3.6-2 Parameter Error Massage

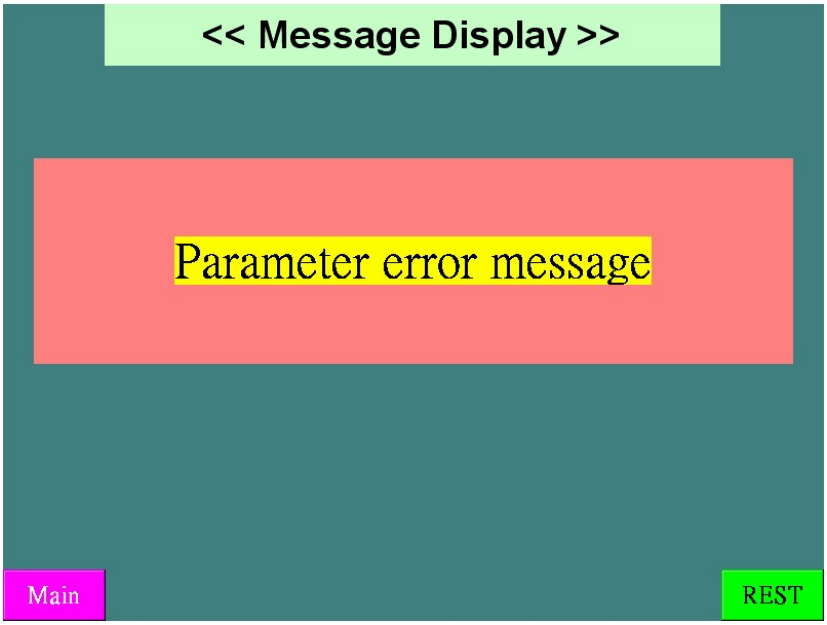


Table 7.1 Parameter error message displayed

Parameter error message display	Remark
1. No material	No material or loading material improperly.
2. Cut Remnant insufficient	Wheel cutting remaining insufficient, change the wheel.
5. Cut probe setting,Select the Y axis handwheel	Wheel detects the position manually, hand wheel didn't control on Y axis function.
7. Cut motor is not RUN	Wheel detects the position, wheel motor didn't turn on.
8. Rigth(B-axis) collet is not close	When setting Y axis center distance, the right collect is open.
11. POS setting, Select the X axis handwheel	When setting cutting position manually, hand wheel didn't control on X axis function.
12. POS setting, Select the Y axis handwheel	When setting the Y axis center distance, hand wheel didn't control on Y axis.
13. POS setting, Select the Z axis handwheel	When setting Z axis manually, hand wheel didn't control on Z axis..
14. POS setting, Select the A axis handwheel	When setting the wheel home position to A axis home position manually, the hand wheel didn't control on A axis.
15. Safety door lock OPEN!(M905)	The safety door didn't close completely.
16. Cutting number is completed	Display the cutting procedure completely.
17. Drawer OPEN(M962)	Drawer didn't close completely.
18. Mode select is not auto	When cycle start, the auto button isn't switched on the controller.
20. Bar off cut length to long	When process auto procedure, it will show alarm and stop the procedure if the length of the off cut is over the limited length.

6.3.6-3 Alarm Message & Solution

Alarm Message & Solution-SRCC screen massage and alarm sentence.			
No	Alarm Message	IO	Solution
0	System OK		
1	Emergency Stop	M13	A. Press emergency stop when emergency situation is happened. B. Press this button will show alarm massage. C. Press this button, all actions will be stopped immediately and all motor power will be shut down as well. D. If emergency situation is solved, operator needs to clear up the processing area. E. Make sure the processing table is safe and release emergency stop button and press “RELEASE" button and CYCLE START” to restart home. F. Check the wire or plug of controller (M13) is loosen or not. Solution: Re-wiring or re-plug in (M13)
2	X Axis servo abnormal		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of X axis (workpiece) spindle abnormal or broken down. D. Troubleshooting.
3	Y Axis servo abnormal		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of Y axis (workpiece) spindle abnormal or broken down. D. Troubleshooting
4	Z Axis servo abnormal.		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of Z axis (workpiece) spindle abnormal or broken down. D. Troubleshooting
5	A Axis servo abnormal.		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of A axis (workpiece) spindle abnormal or broken down. D. Troubleshooting

6	6. B Axis servo abnormal.		Before press "Reset" button, please check servo no in the control box： A. A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of B axis (workpiece) spindle abnormal or broken down. D. Troubleshooting
7	C Axis servo abnormal		Before press "Reset" button, please check servo no in the control box： A. A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.) C. Servo motor or driver of C axis (workpiece) spindle abnormal or broken down. D. Troubleshooting
8	X axis back to home POS alarm		A. Check if limited sensor is normal. (on Manual Mode-3 monitor) (X axis limited sensor is mechanical, if home is abnormal, it's able to press limited sensor switch to check any abnormal condition.) B. Check if wire is loosen
9	Y axis back to home POS alarm		A. Check if limited sensor is normal. (on Manual Mode-3 monitor) (X axis limited sensor is mechanical, if home is abnormal, it's able to press limited sensor switch to check any abnormal condition.) B. Check if wire is loosen
10	Z axis back to home POS alarm		A. Check if limited sensor is normal. (on Manual Mode-3 monitor) B. Check if wire is loosen
11	A axis back to home POS alarm		A. Check if limited sensor is normal. (on Manual Mode-3 monitor) B. Check if wire is loosen
12	B axis back to home POS alarm		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.)
13	C axis back to home POS alarm		Before press "Reset" button, please check servo no in the control box： A. Check abnormal number showed on actuator. B. Refer to chapter 9. (Actuator of servo motor alarm number.)
14	X axis +Lim movement		A. When doing auto run, X axis moves to touch positive limited (+Lim). B. Check parameter setting
15	X axis -Lim movement		A. When doing auto run, X axis moves to touch positive limited (+Lim). B. Check parameter setting
16	Y axis +Lim movement		A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting
17	Y axis -Lim movement		A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting

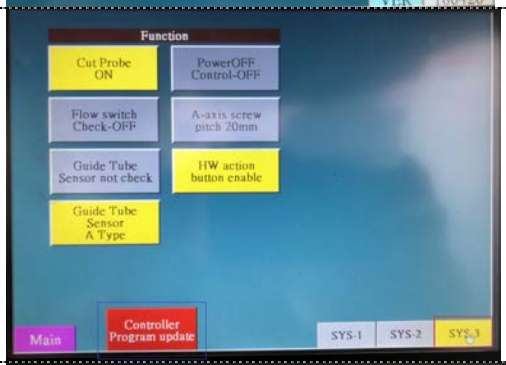
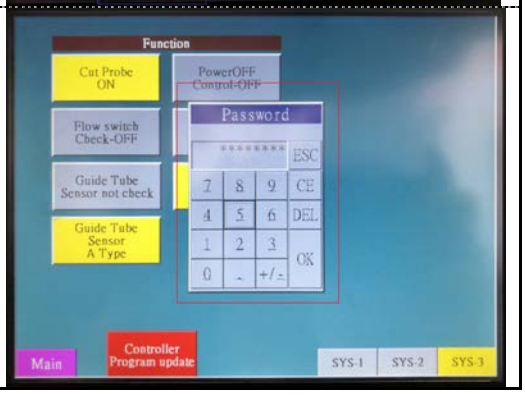
18	Z axis +Lim movement		A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting
19	Z axis -Lim movement		A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting
20	A axis +Lim movement		A. A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting
21	A axis -Lim movement		A. When doing auto run, A axis moves to touch positive limited (+Lim). B. Check parameter setting
22	X axis follow error		A. A. Setting value too low on Page “System Parameter-2” “Accerelation (msec)” B. Foreign material inside or some parts interfered. Solution：Reset the machine and check.
23	Y axis follow error		A. Setting value too low on Page “System Parameter-2” “Acceleration (msec)” B. Foreign material inside or some parts interfered. Solution：Reset the machine and check.
24	Z axis follow error		A. Setting value too low on Page “System Parameter-2” “Acceleration (msec)” B. Foreign material inside or some parts interfered. Solution：Reset the machine and check.
25	A axis follow error		A. Setting value too low on Page “System Parameter-2” “Acceleration (msec)” B. Foreign material inside or some parts interfered. Solution：Reset the machine and check.
26	B axis follow error		A. Setting value too low on Page “System Parameter-2” “Acceleration (msec)” B. Foreign material inside or some parts interfered. C. Rotating abnormal when installing the collet Solution：Reset the machine and check.
27	C axis follow error		A. Setting value too low on Page “System Parameter-2” “Acceleration (msec)” B. Foreign material inside or some parts interfered. C. Rotating abnormal when installing the collet Solution：Reset the machine and check.
28	Wheel spindle motor abnormal	M900	A. Frequency converter abnormal B. Frequency converter broken C. Motor Broken
29	Coolant motor alarm	M901	A. Coolant motor is overload. Solution: To external connect the power supply of coolant motor, and extra assemble solenoid valve.
30	Oil mist collector motor alarm	M902	A. Oil mist collected motor is overload. Solution: To external connect the power supply of Oil mist collected motor

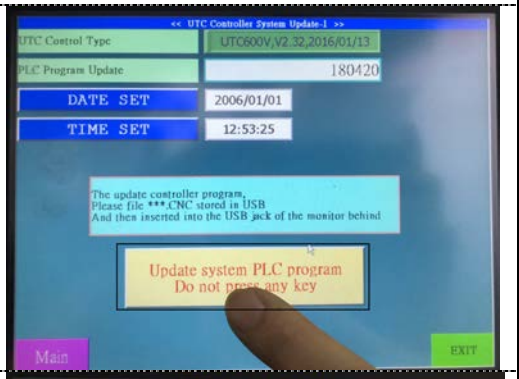
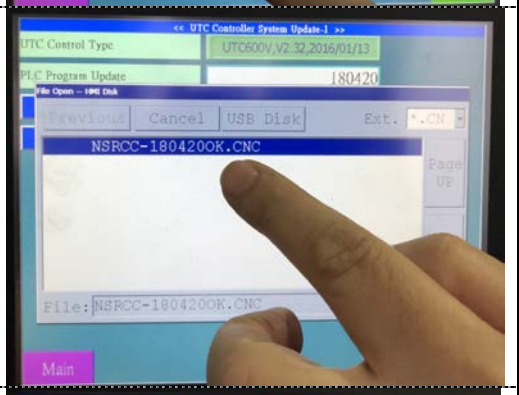
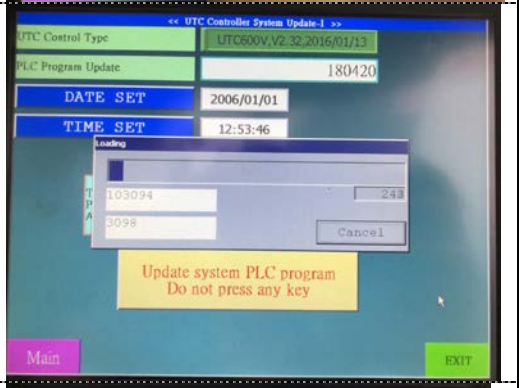
31	Lubricating oil not enough	M903	A. The lubricating oil is not enough on rail. Solution: add enough lubricating and use “R68”.
32	Air pressure not enough	M904	Check air pressure.
33	Safety door=open abnormal.	M905	Check the door is clock
34	Abnormal		
35	Abnormal		
36	Right (B Axis) collet abnormal	M908	A. Right collet cylinder isn’t action, check solenoid valve. B. The sensor of right collet oil pressure cylinder is not on correct position, adjust the sensor position. C. The sensor of right collet oil pressure cylinder is broken, check sensor.
37	Left (C Axis) collet abnormal	M909	A. Right collet cylinder isn’t action, check solenoid valve. B. The sensor of right collet oil pressure cylinder is not on correct position, adjust the sensor position. C. The sensor of right collet oil pressure cylinder is broken, check sensor
38	Loading-Up abnormal	M910	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
39	Loading –Holding abnormal (No material)	M911	A. No material or loading in abnormal B. Sensor position is incorrect, adjust the sensor position. C. Sensor is broken, check the sensor.
40	Loading down abnormal	M912	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
41	Pusher cylinder- front abnormal	M913	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
42	Pusher Cylinder-back abnormal	M914	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
43	Stopper front alarm – abnormal	M915	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
44	Stopper back alarm-Sensor –abnormal	M916	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
45	Rotate arm UP alarm – abnormal	M917	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
46	Rotate arm down alarm	M918	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
47	Extend arm front alarm – abnormal	M919	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
48	Extend arm back alarm-abnormal	M920	A. Sensor position is incorrect, adjust the sensor position. B. Sensor is broken, check the sensor.
49	Flow switch alarm	M921	A. coolant flow rate is insufficient B. Sensor broken, check the sensor or wire
50	short bar loading front alarm – abnormal	M922	A. Reserve the connection. B. Sensor position is incorrect, adjust the sensor position. C. Sensor broken, check the sensor or wire

51	Short bar loading back alarm – abnormal	M923	A. Reserve the connection. B. Sensor position is incorrect, adjust the sensor position. C. Sensor broken, check the sensor or wire
52	Cutter probe sensor alarm –abnormal	M220	A. Sensor broken, check the sensor or wire
53	Cutter probe sensor alarm (Excessive error)		A. detect position is incorrect, adjust detect position for X axis and Y axis. B. Detective sensor is not clear, clean the sensor. C. Check the cutting if it needs to be exchanged.
54	Bushing sensor alarm –abnormal	M930	A. There is foreign stuff between long guide and V block, remove it.
55	Feed sensor alarm or No material	M931	A. No material or loading improperly. B. Check stopper. C. Sensor position is incorrect, adjust the sensor position. D. Sensor broken, check the sensor or wire
56	Spindle motor current overload		A. Spindle motor current is overload. B. Speed is too fast
57	Remain material front alarm –abnormal	M958	A. Sensor position is incorrect, adjust the sensor position. B. Sensor broken, check the sensor or wire
58	Remain material back alarm –abnormal	M959	A. Sensor position is incorrect, adjust the sensor position. B. Sensor broken, check the sensor or wire
59	Drawer lock sensor alarm	M962	A. Sensor position is incorrect, adjust the sensor position. B. Sensor broken, check the sensor or wire
60	Loading Test, Material not avaliable		A. Material is detected when loading. B. Remove the material
61	Second security door open alarm	M906	A. Check the door is closed completely. (Loading box, left door, right door, back door.)
62	Probe cylinder-Front abnormal	M963	A. Check cylinder. B. Sensor position is incorrect, adjust the sensor position. C. Sensor broken, check the sensor or wire
63	Probe cylinder-Back abnormal	M964	A. Check cylinder. B. Sensor position is incorrect, adjust the sensor position. C. Sensor broken, check the sensor or wire
64	Bar O.D detect cylinder abnormal	M965	A. Check cylinder. B. Sensor position is incorrect, adjust the sensor position. C. Sensor broken, check the sensor or wire
65	Bar O.D detected over difference.		A. Bar O.D detected over difference.
66	Fire extinguisher turn on	M966	A. Emengcy happened, caused fire extinguisher turn on.
67	Abnormal		
68	Coolant box lever high	M970	A. Check the coolant motor.
69	Abnormal		

6.4 Program / Screen Updating Steps

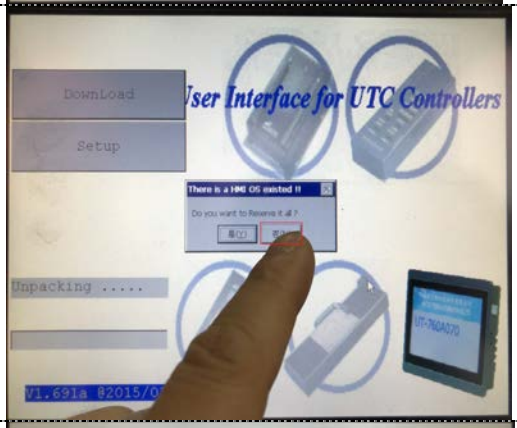
A. Program Updating Steps

Description	Photo
Step 1 a. Download the updating file for Program / screen updating from Chia Lern. b. Insert the USB back to the controller.	
Step 2 a. On the main screen to press “System Setting” b. Press password “89823631”.	
Step 3 a. On “SYS-3” screen, you will see the red button and press “Controller Program Updating”.	
Step 4 a. The password screen comes out. b. Enter the password “89823635”	

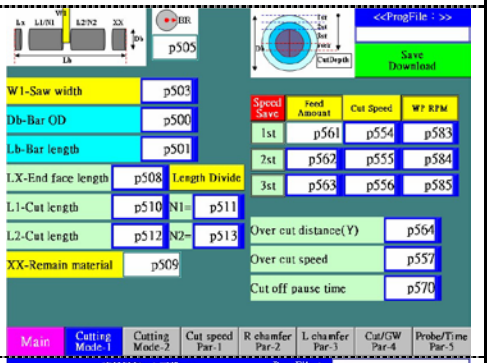
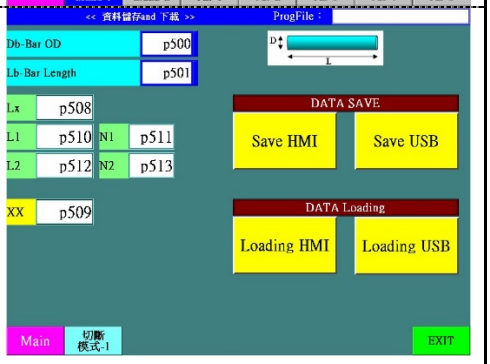
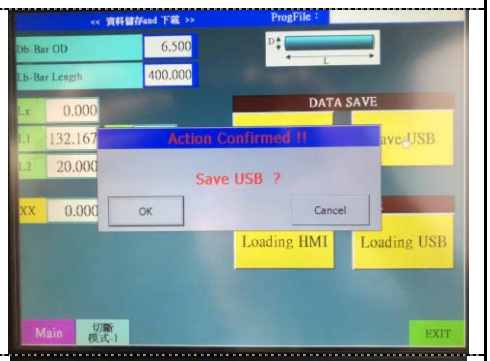
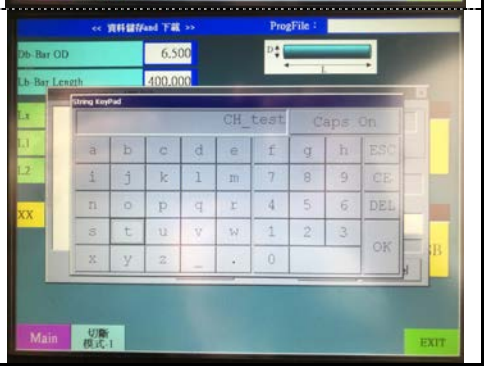
Description	Photo
Step 5 a. The screen of “UTC Controller System Updating-1” will come out. b. Press the button of Update system PLC program”.	
Step 6 a. “File Open” screen will come out. b. Select “.CNC” file.	
Step 7 a. The program is downloading and updating.	
Step 8 a. The screen will back to the main screen after downloading processing is done. b. See the “Program Update” version is updated to newest version.	

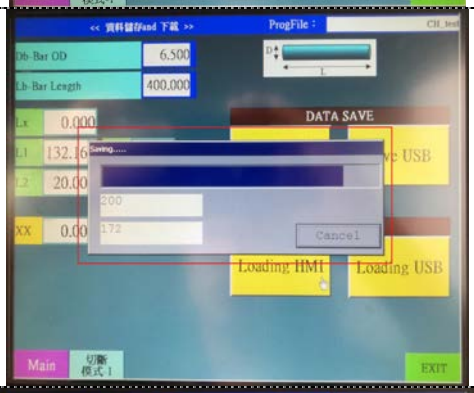
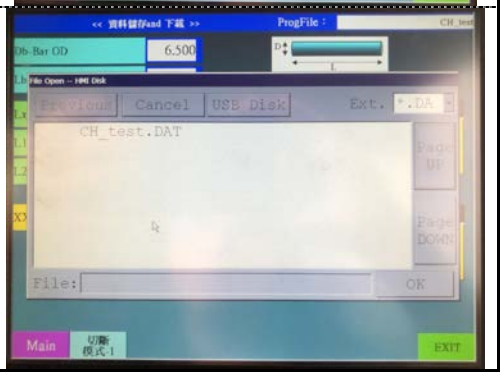
B. Screen Updating Steps

Description	Photo
Step 1 a. Download the updating file for Program / screen updating from Chia Lern. b. Insert the USB back to the controller.	
Step 2 a. Press the up left side of blank position.	
Step 3 a. Password screen comes out. b. Enter the password “27882162”.	
Step 4 a. The “Massage” screen will come out. b. Press “Ok”	

Description	Photo
Step 5 a. Press “Download” on left screen. b. The “file List” screen comes out. c. Select the file “.dlz”.	
Step 6 a. Press “NO” on screen of “do you want to reserve it all?”	
Step 7 a. Press “NO” on screen of “do you really want to delete all?”	
Step 8 a. UTC controller is running the updating. b. After this processing is done, all the screen has done the updating. c. Turn off the machine and turn on the machine for working.	

C. Data save and Download steps.

Description	Photo
a. Press “ProgFile” on the upon right side of “Cut Speed Par-1” screen： 	
a. The screen will be changed to the screen of “Data save and download” b. Function： ● Save HMI: Save all program data to HMI. ● Save USB: Save all program data to USB. (USB must be inserted into backside of screen.) ● Loading HMI: Uploading the data from HMI. ● Loading USB: Uploading the data from USB. *Data save data included: Cutting Mode-1、R Chamfer Par-2 、 L Chamfer Par-3 、Cut/GW Par-4 、Probe/Time Par-5.	
a. Whatever choose either “SAVE HMI” or “SAVE USB, all the data will be saved. b. The screen of “Action Controlled!!” will come out. c. Press ”ok”。	
a. The file name can be named by operator.	

Description	Photo
a. When finished entered, the saving screen will come out, press “SAVE”.	
a. After pressing “SAVE”，saving process will be started.	
a. After saving, the file name will come out to the saving list. b. Press “OK” back to the main saving screen.	

7. Electric Control Box

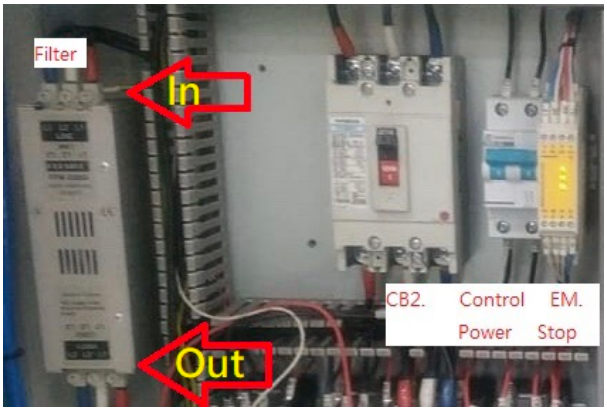
***Electric control box is composed differently according to different request of voltage and function.**

***Red wire：AC220 control wire / Blue wire：DC24V control wire / Black wire：Main power wire.**



(Dwg.1)

1. Converter：Apply for wheel spindle motor. (AC transmission to DC，DC controls RPM.)
   Abnormal: servo motor shows alarm number. (Refer to operator manual in Charp.8)
2. X、Y、Z、A、B、C Axis：Control each axis movement.
   After turn on the machine, before transmission the power, servo motor shows “bb”, after transmission the power, shows “run”.
3. Exhaust Fan：Exhausting the air.



(Dwg.2)

4. Security Module (EM Stop)：Safety door function control is to block the converter transmission the power to the motor; operator must be make sure the door is closed to release the safety door function and run the machine.
   *When turn on the machine, it will light up 1 ligther, release the emengecy stop, and press the “Reset” button, all 3 lighter will light up, which mean machine is transmission the power to motive power and control power.
5. Control Power：Control power protector, AC 220V power control. (Refer to main power electrical diagram L13L33)

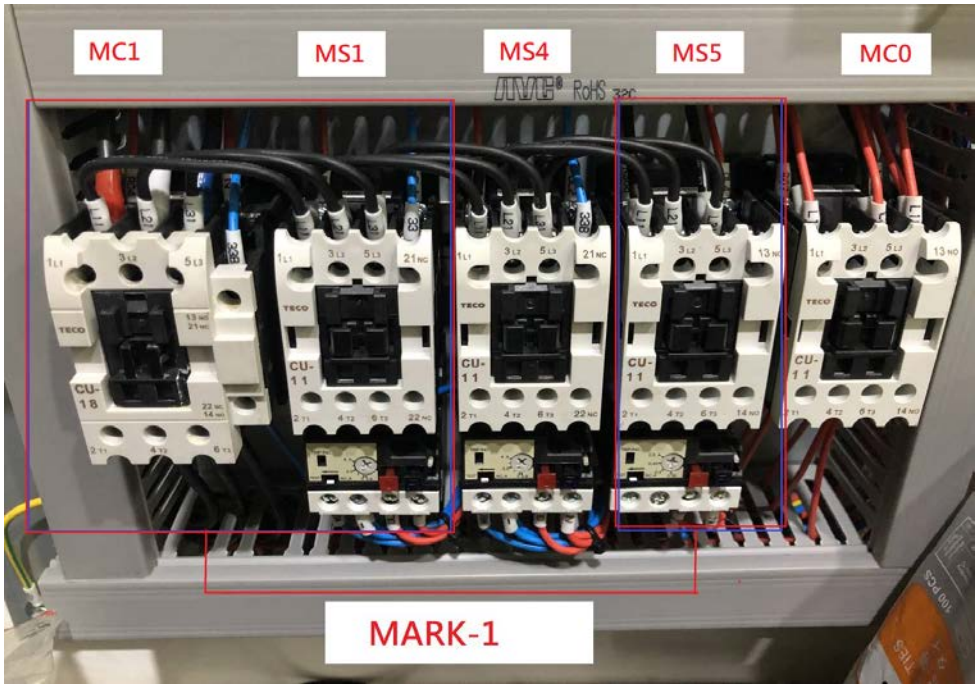
*Transmission power procedure：Switch on the “control power” button, transmission the power to ACV control switch-red wire (MCO), also switch on all AC control wire.

6. Non-fuse Breaker (CB2)：AC220V power control protector.

Abnormal: If sitch is positioned at the middle between green and red, means the currenct is overload.

7. Fliter / Voltage Stabilizer (FPM)：Stabilize the current. In: Primary; Out: Secondary.

Abnormal: Use three-meter electric meter to measure if the secondary is 220V.



(Dwg.3)

8. Overload Solenoid Value for Coolant Motor (MS1)：Preset motor overload: 0.5KW.
(Refer to Main Electrical Diagram)

9. Overload Solenoid Value for Mist Exhauster Motor (MS4)：Preset motor overload: 0.5KW.
(Refer to Main Electrical Diagram)

9. Overload Solenoid Value for Script Motor (MS5)：Preset motor overload：0.5KW.
(Refer to Main Electrical Diagram)

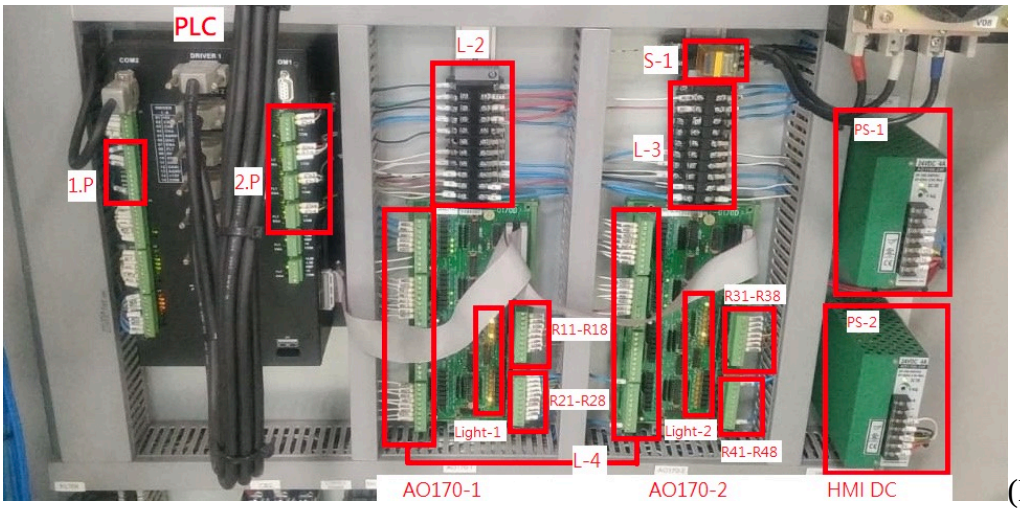
10. Main Power Switch for each axis and servo motor- Black wire. (MC1) (Refer Dwg.1)

11. ACV Control wire switch for each axis and servo motor-Red wire (MC0) (Refer Dwg.1)

*Item **No.5 Control power** supplies the power to item **No. 11 ACV control wire switch,** operator must be turn on the item **No. 5** to switch on item **No. ACV control wire.**

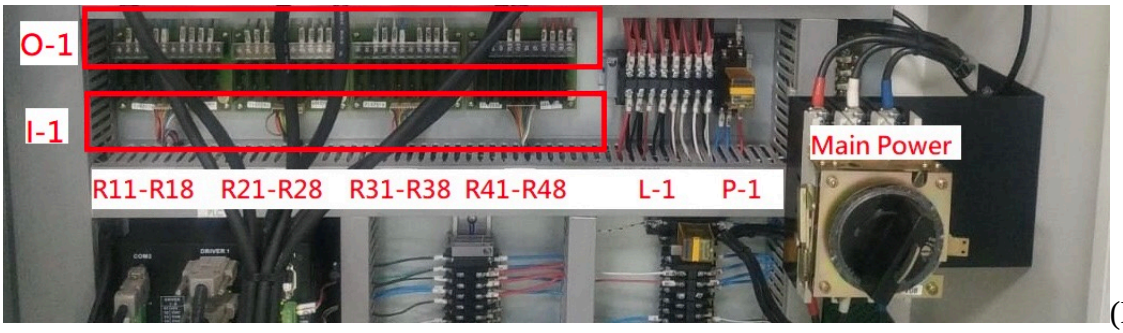
*Both item No. 11 and 12 must be switch on to running each axis, converter and servo actuator. (Dwg.1)

12. Solenoid Value switch Primary (Mark-1)：After “Main Power” and “Non-fuse Breaker” are on, solenoid value swith primary is on as well.
Abnormal: Use three-meter electric meter to measure the voltage.



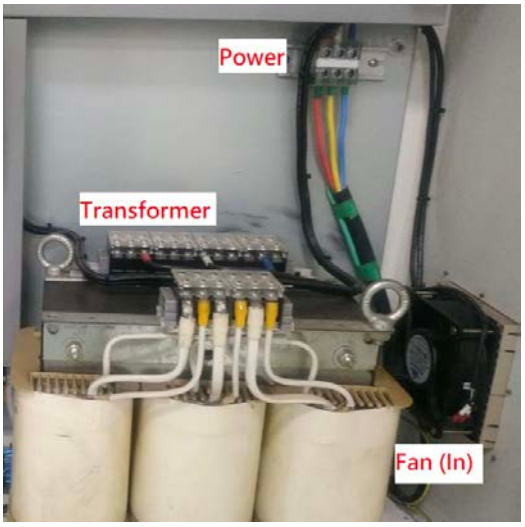
(Dwg.4)

13. Power Supplier (PS-1)：Supply the power to all the sensors.
14. Power Supplier (PS-2)：Supply the power to HMI control.
15. AO170-1 & AO170-2 extended board：R31-R38 / R41-R48 / R11-R18 / R21-R28 are output of solenoid value；Each connection refers to “Solenoid Value Power Supply DC24V”
16. AO170-1 & AO170-2 extended board：Dwg.4 L-4 connection refer to “Control Electrical Diagram” “Extended board-1 & 2”.
17. L-2 / L-3：DC24V wires of sensor collected board.
18. S-1：Solenoid Value：Applied for cutting wheel probe mechanism.
19. Light-1 / Ligth-2：Displayed light on when solenoid valve is running.
20. PLC：Refer to operator manual chapter 7. (Controller electrical diagram)
    1.P / 2.P refer to electrical diagram “Limited Sensor Controller Panel Electrical Diagram”

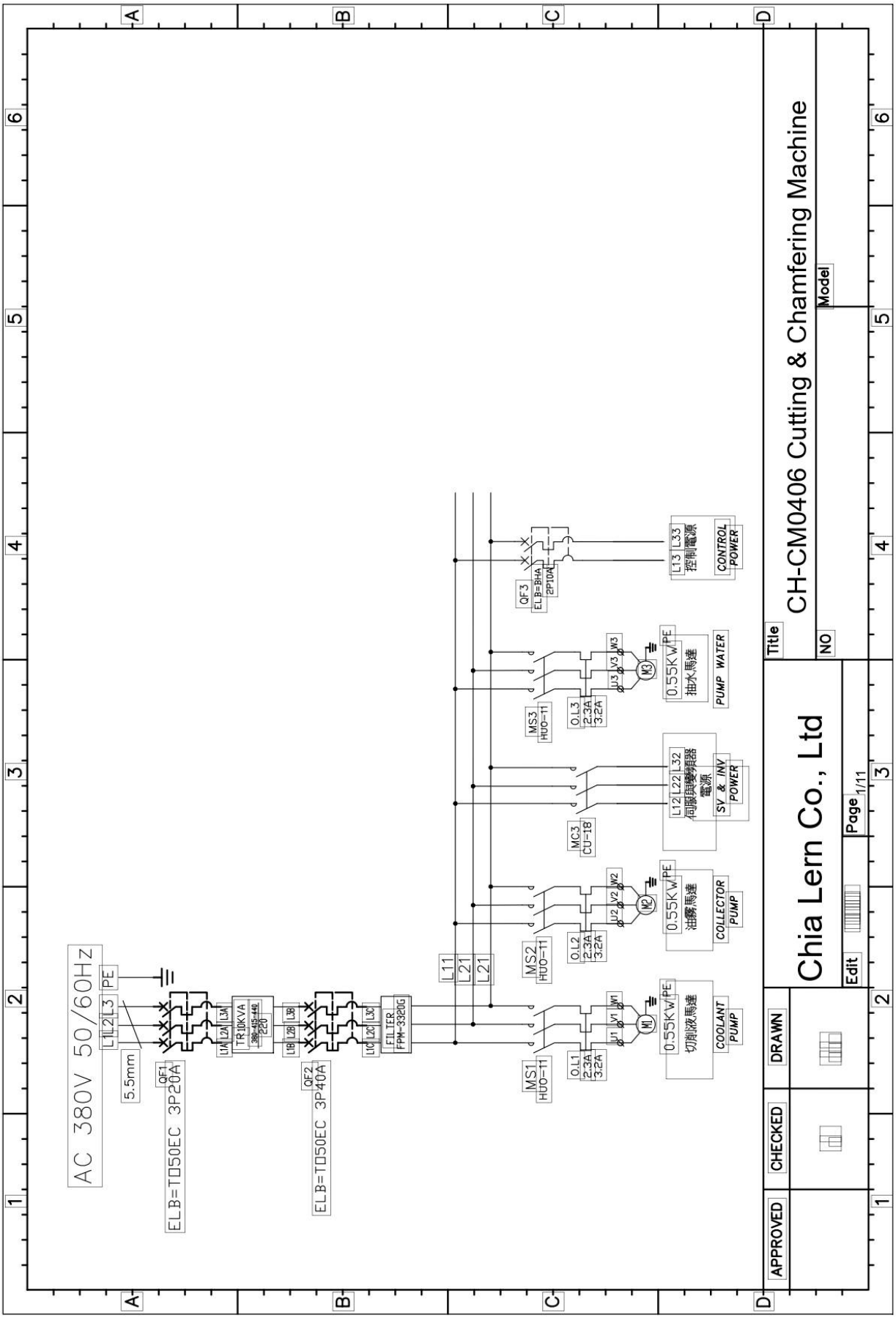


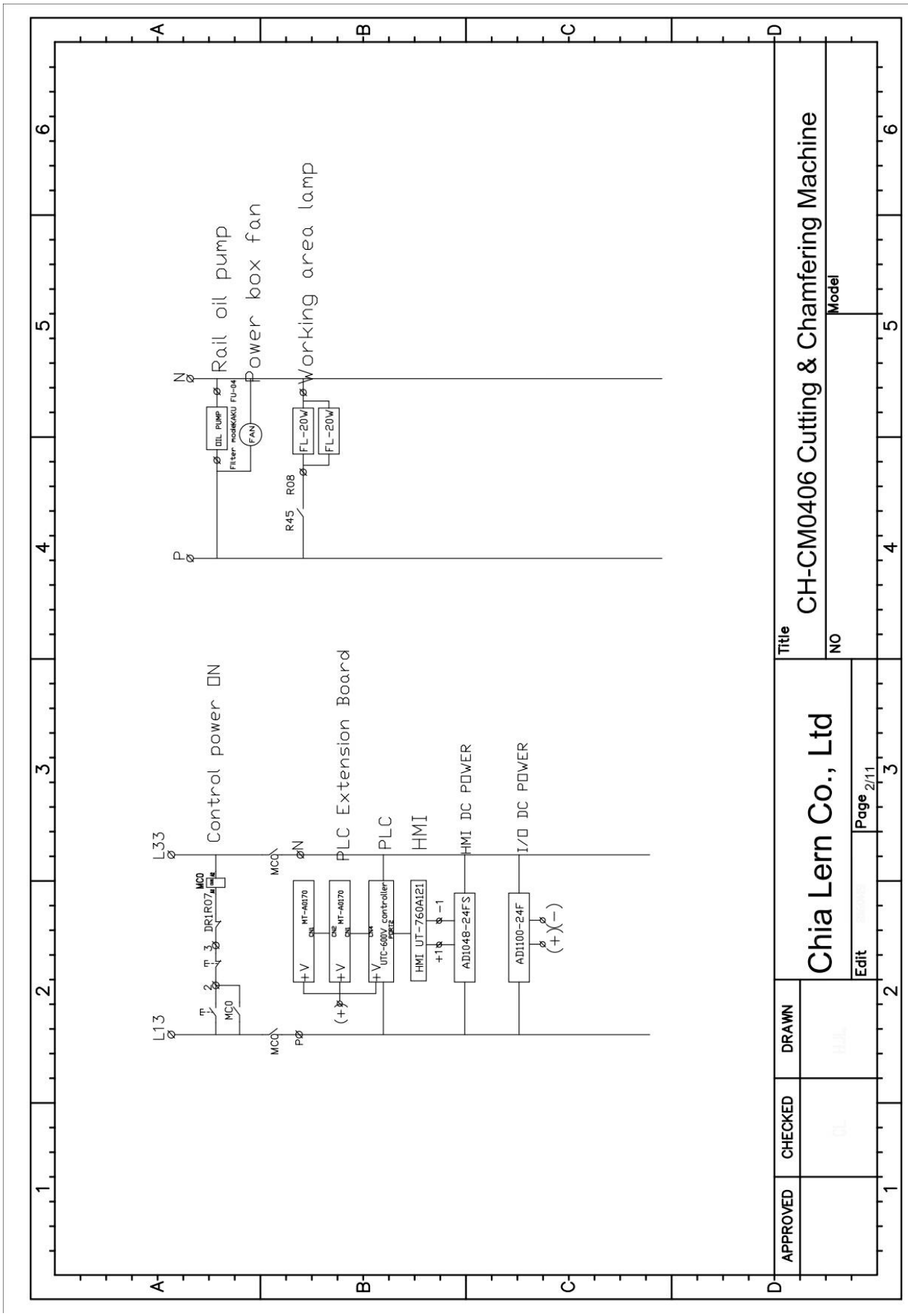
(Dwg.5)

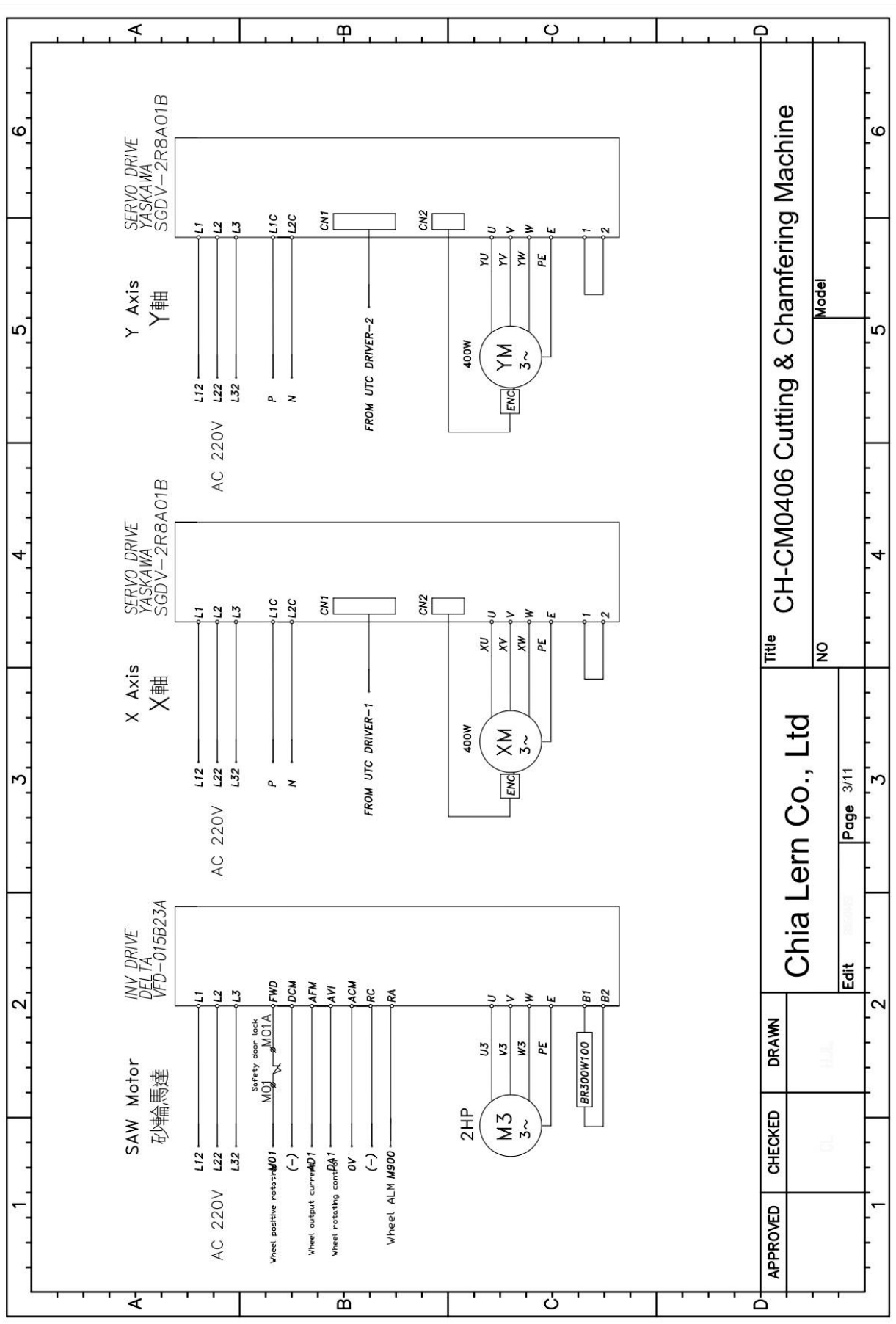
21. Non-fuse Breaker (380V)：Main power switch; supply 380V transmission to converter 220V, converter transmission the power to item No. 5 “Control Power”.
22. Auto Shut down (P-1)：Auto shut down control system; according to the setting from parameter when setting processed number is done, machine will shut down the machine automatically.
23. L-1：The wire connected board for Dwg.3, item 1 converter and C axis wire.
24. O-1：R31-R38 / R41-R48 / R11-R18 / R21-R28 are solenoid OUTPUT. (Refer to solenoid value output electrical diagram.

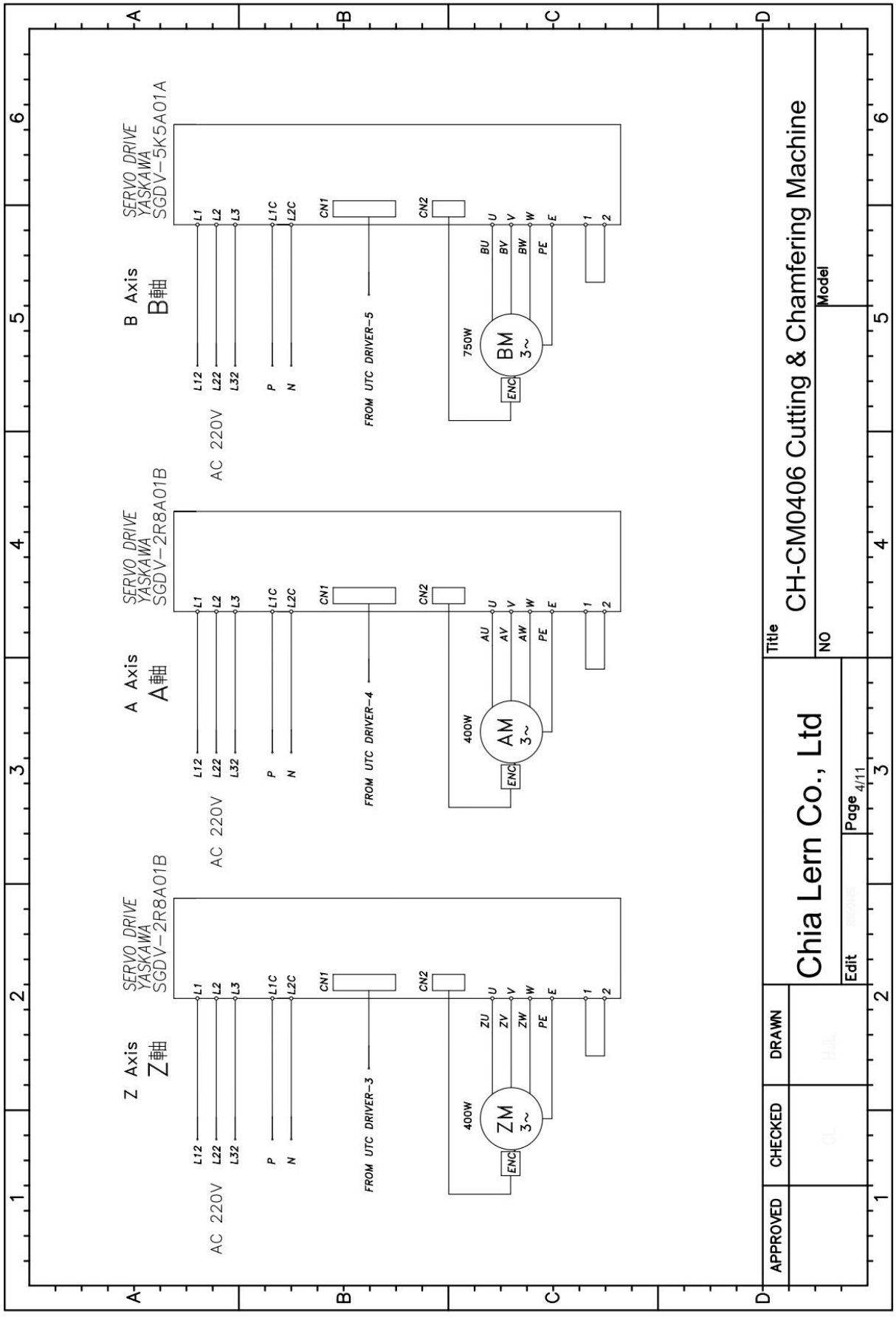


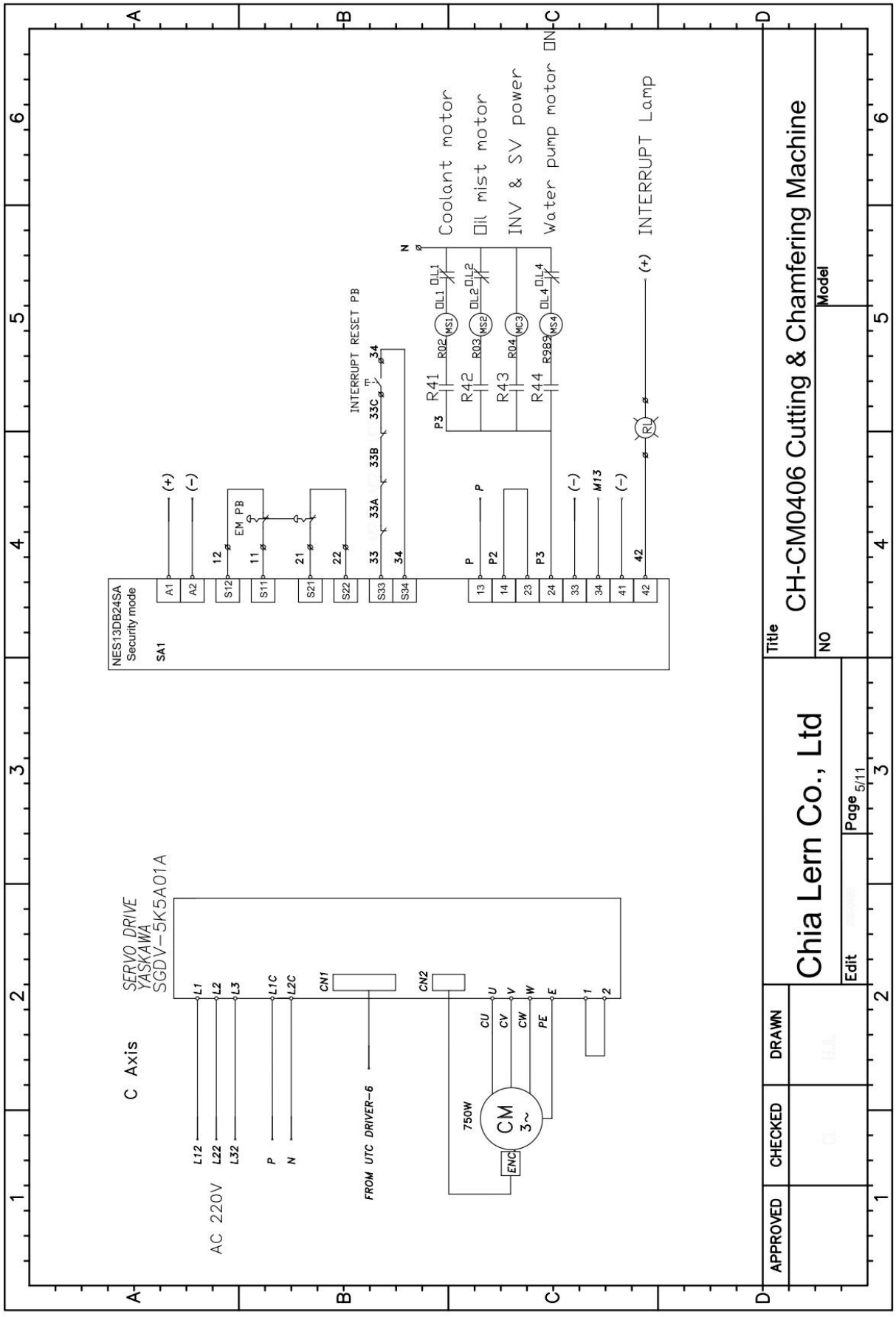
25. Power Input：Input the main power from customer’s side.
26. Transformer：380V, according to customer’s request to transmission the voltage.
27. Fan：Sucking air fan.

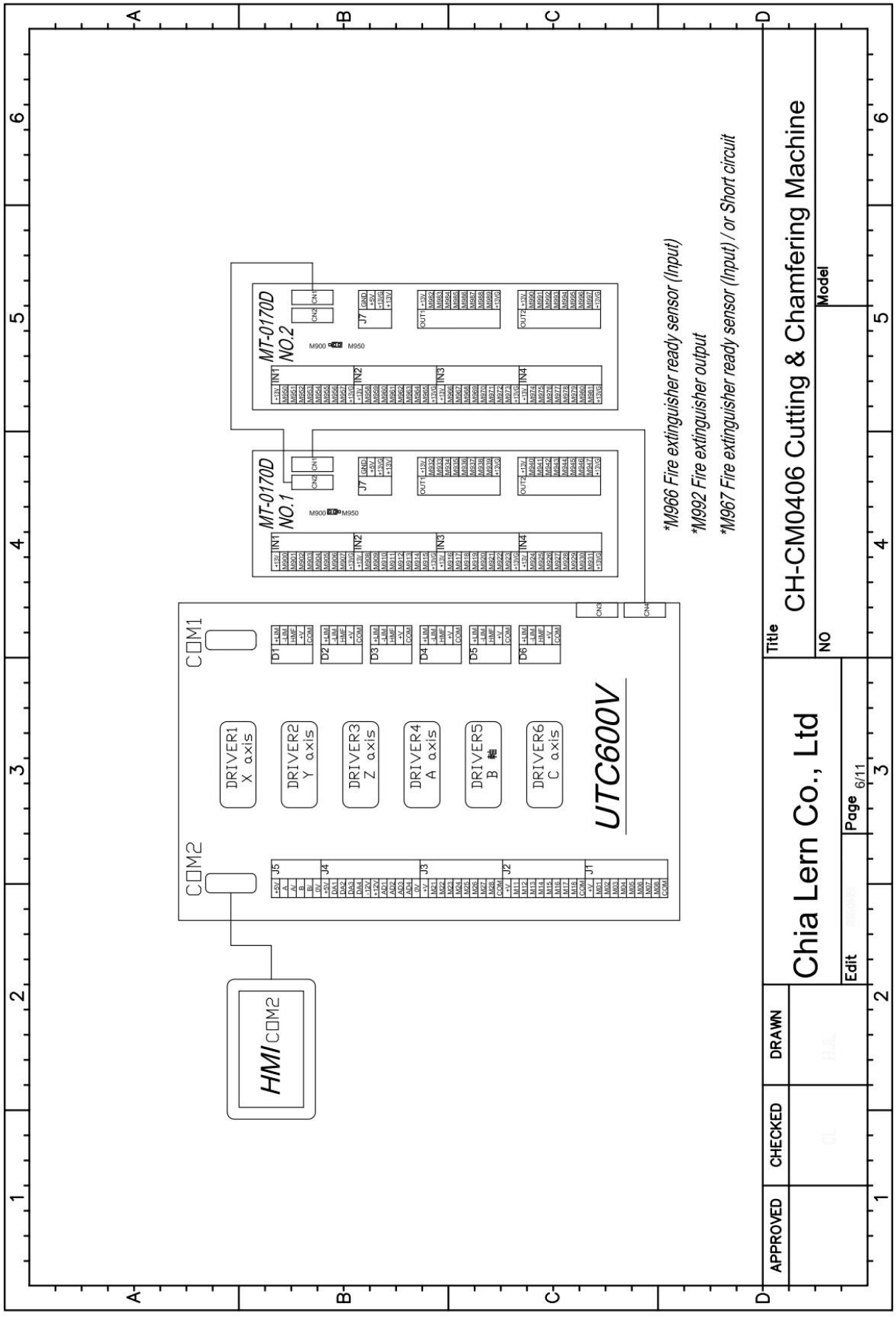

AC 380V 50/60Hz
L1 L2 L3 PE
5.5mm
QF1
ELB=TD50EC 3P20A
TR10KVA
380-415-440
220
QF2
ELB=TD50EC 3P40A
FILTER
FPM-320DG
L11
L21
L21
MS1
HU0-11
O.L1
2.3A
3.2A
0.55KW PE
切削液馬達
COOLANT PUMP
MS2
HU0-11
O.L2
2.3A
3.2A
0.55KW PE
油霧馬達
COLLECTOR PUMP
MC3
CU-18
L12 L22 L32
伺服與變頻器電源
SV & INV POWER
MS3
HU0-11
O.L3
2.3A
3.2A
0.55KW PE
抽水馬達
PUMP WATER
QF3
ELB=BHA
2P10A
L13 L33
控制電源
CONTROL POWER
APPROVED
CHECKED
DRAWN
Chia Lern Co., Ltd
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Title
CH-CM0406 Cutting & Chamfering Machine
NO
Model

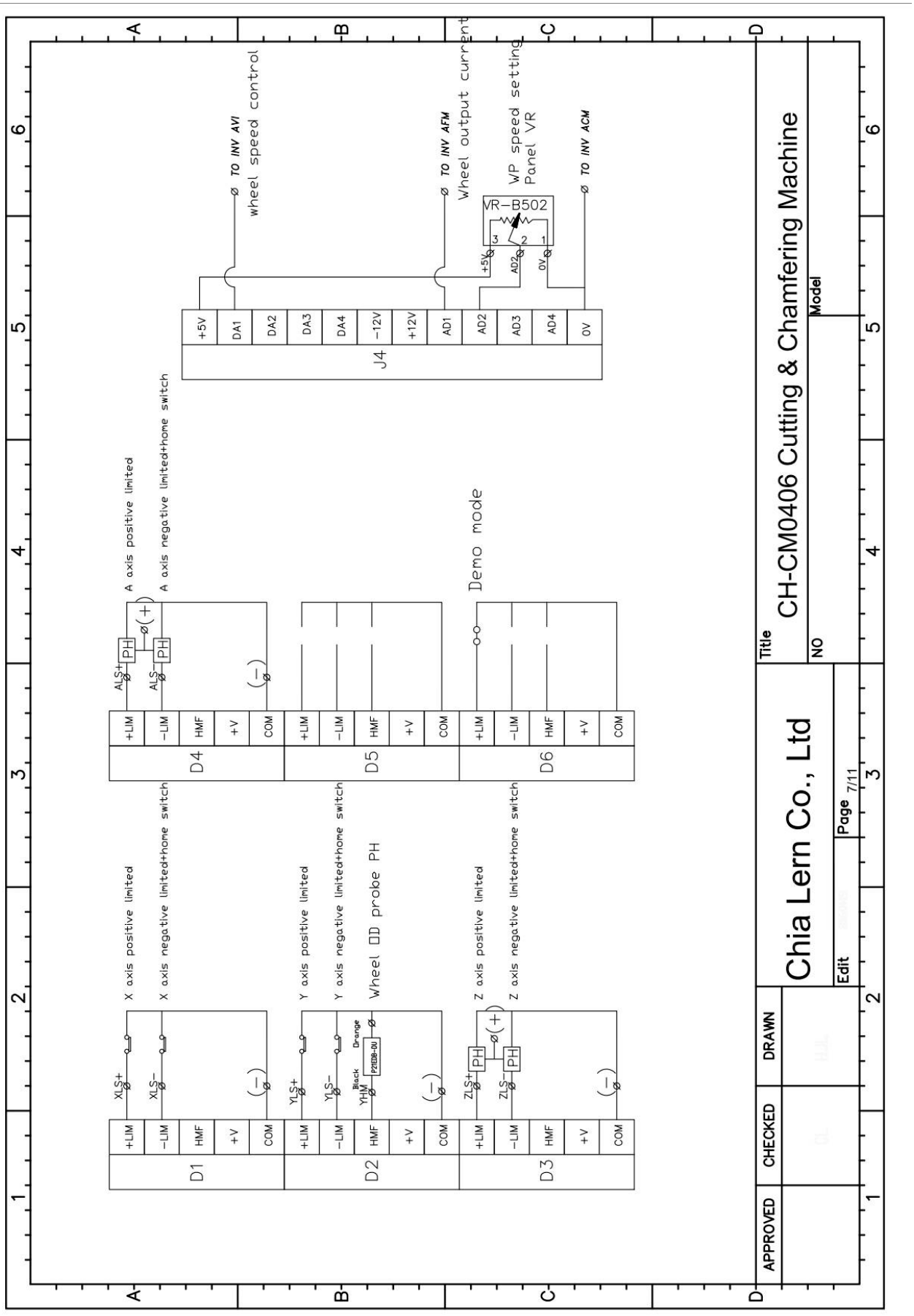

Control power ON
PLC Extension Board
PLC
HMI
HMI DC POWER
I/O DC POWER
Rail oil pump
Power box fan
Working area lamp
L13
L33
N
P
MCO
DR1R07
MT-AD170
UTC-600V controller
HMI UT-760A121
AD1048-24FS
AD1100-24F
OIL PUMP
FAN
FL-20W
R45
R08
APPROVED
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DRAWN
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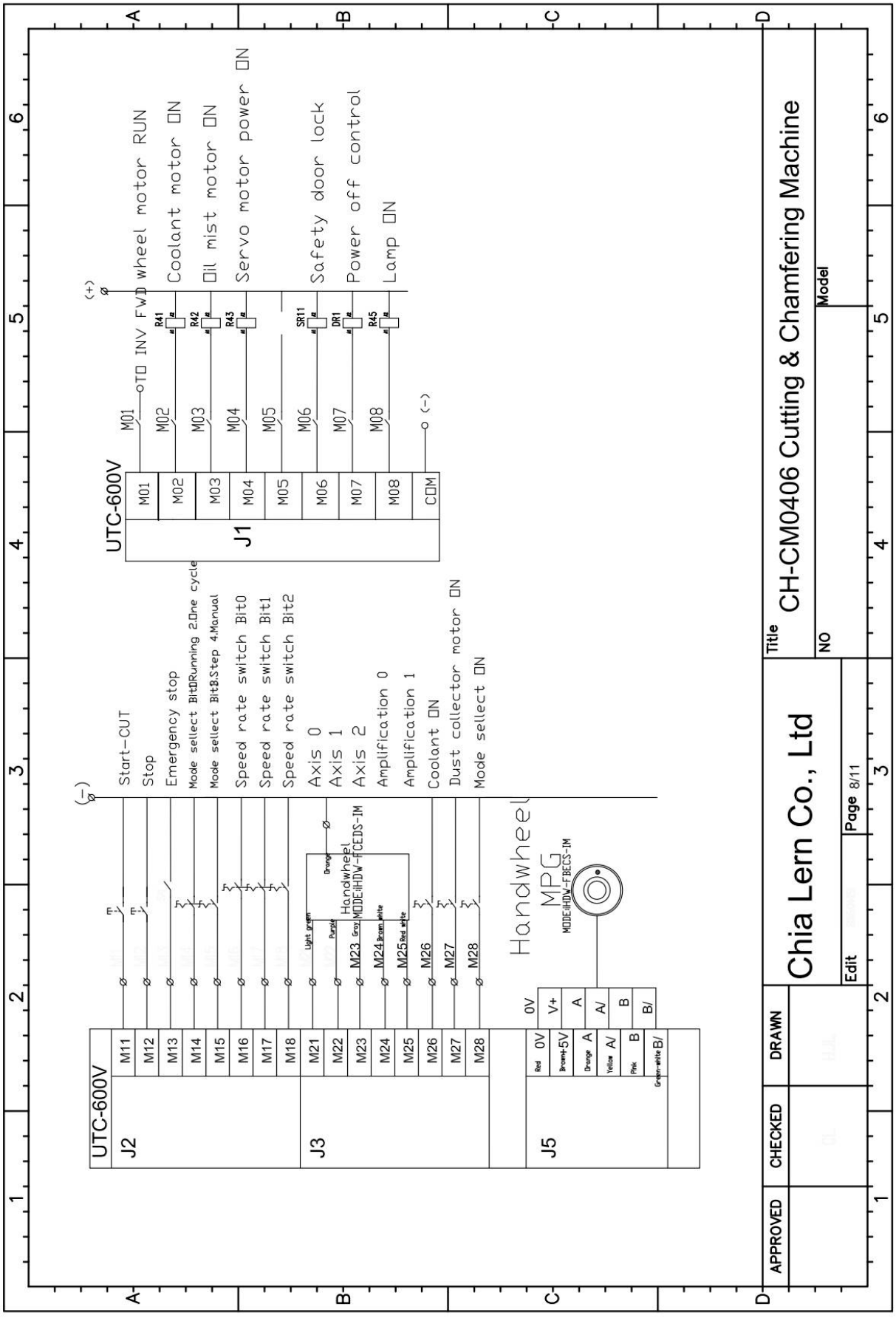

SAW Motor
砂輪馬達
INV. DRIVE
DELTA
VFD-015B23A
AC 220V
L12
L22
L32
L1
L2
L3
Safety door lock
M01
M01A
FWD
DCM
AFM
AVI
ACM
RC
RA
Wheel positive rotating M01
(-)
Wheel output current AD1
Wheel rotating control DA1
0V
(-)
Wheel ALM M900
2HP
M3
3~
U3
V3
W3
PE
U
V
W
E
B1
B2
BR300W100
X Axis
X軸
SERVO DRIVE
YASKAWA
SGDV-2R8A01B
AC 220V
L12
L22
L32
L1C
L2C
P
N
CN1
CN2
FROM UTC DRIVER-1
400W
XM
3~
ENC
XU
XV
XW
PE
U
V
W
E
1
2
Y Axis
Y軸
SERVO DRIVE
YASKAWA
SGDV-2R8A01B
AC 220V
L12
L22
L32
L1
L2
L3
L1C
L2C
P
N
CN1
CN2
FROM UTC DRIVER-2
400W
YM
3~
ENC
YU
YV
YW
PE
U
V
W
E
1
2
APPROVED
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Chia Lern Co., Ltd
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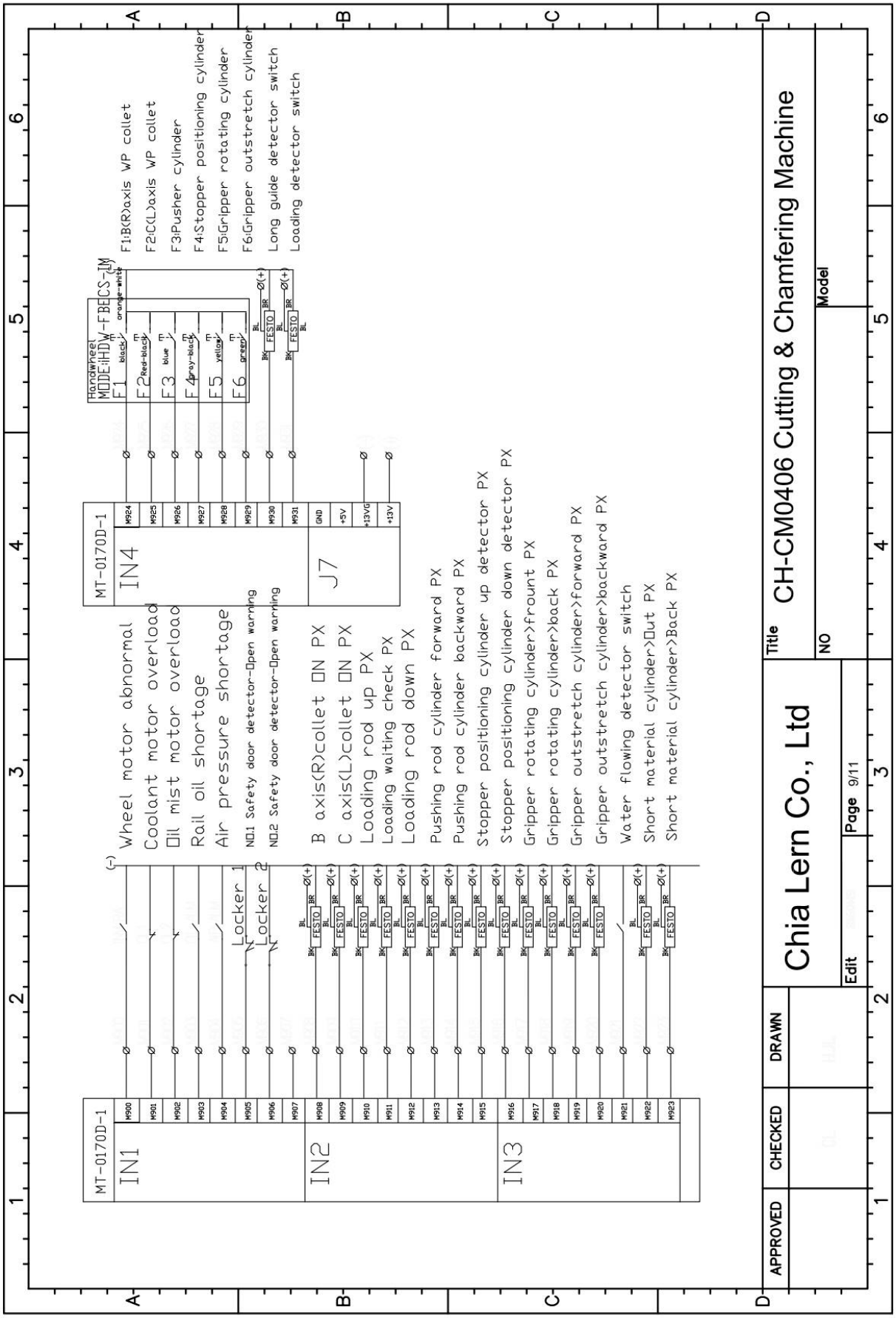

Z Axis
Z軸
SERVO DRIVE
YASKAWA
SGDV-2R8A01B
AC 220V
L12
L22
L32
L1
L2
L3
L1C
L2C
P
N
CN1
CN2
FROM UTC DRIVER-3
400W
ZM
3~
ENC
ZU
ZV
ZW
PE
U
V
W
E
1
2
A Axis
A軸
SERVO DRIVE
YASKAWA
SGDV-2R8A01B
AC 220V
FROM UTC DRIVER-4
400W
AM
3~
AU
AV
AW
B Axis
B軸
SERVO DRIVE
YASKAWA
SGDV-5K5A01A
AC 220V
FROM UTC DRIVER-5
750W
BM
3~
BU
BV
BW
APPROVED
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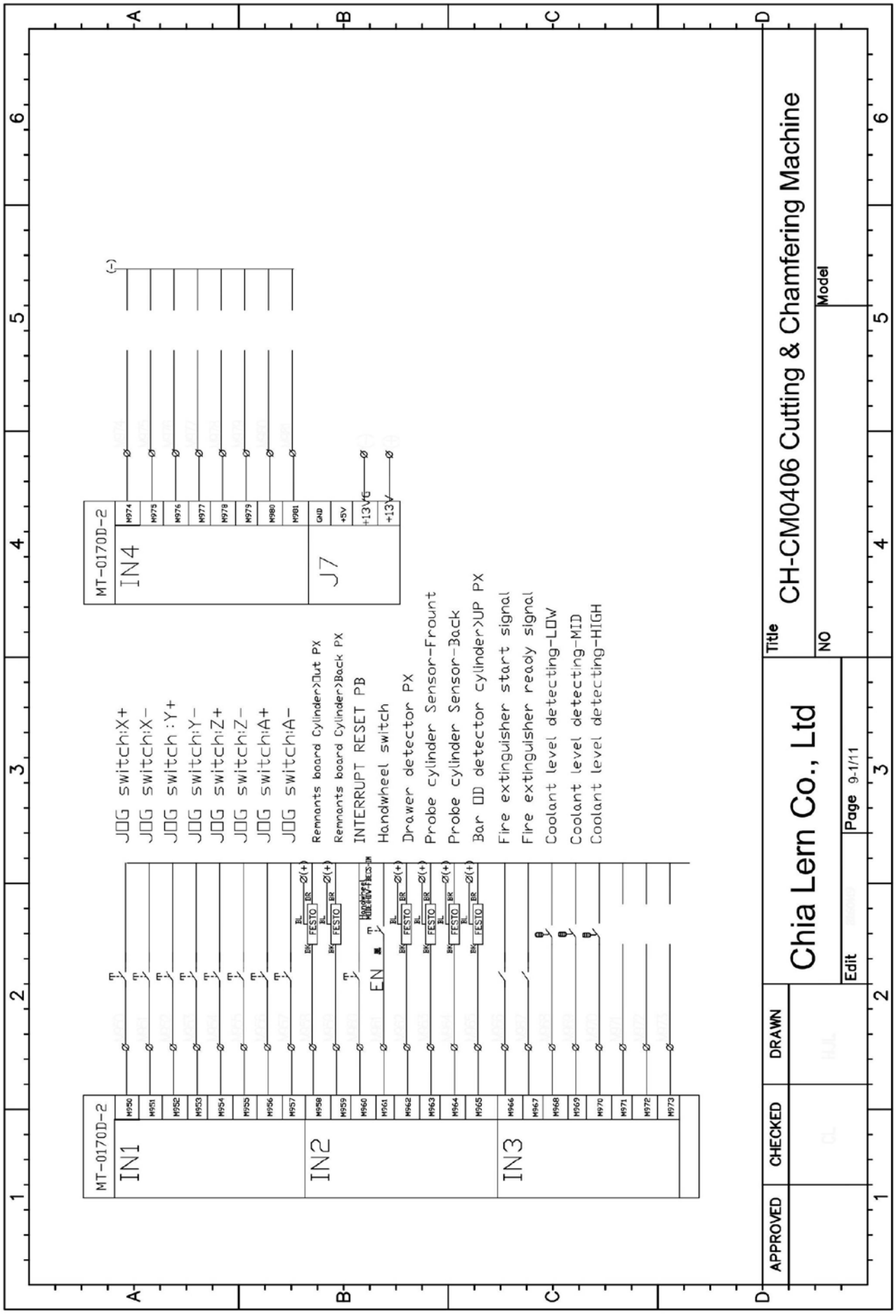

C Axis
SERVO DRIVE
YASKAWA
SGDV-5K5A01A
AC 220V
L12
L22
L32
P
N
L1
L2
L3
L1C
L2C
CN1
CN2
FROM UTC DRIVER-6
750W
CM
3~
ENC
U
V
W
PE
CU
CV
CW
1
2
NES13DB24SA
Security mode
SA1
A1
A2
S12
S11
S21
S22
S33
S34
12
11
21
22
33
34
EM PB
INTERRUPT RESET PB
33A
33B
33C
P
P2
P3
13
14
23
24
41
42
(+)
(-)
M13
R41
R42
R43
R44
R02
R03
R04
R389
MS1
MS2
MC3
MS4
Coolant motor
Oil mist motor
INV & SV power
Water pump motor
INTERRUPT Lamp
RL
APPROVED
CHECKED
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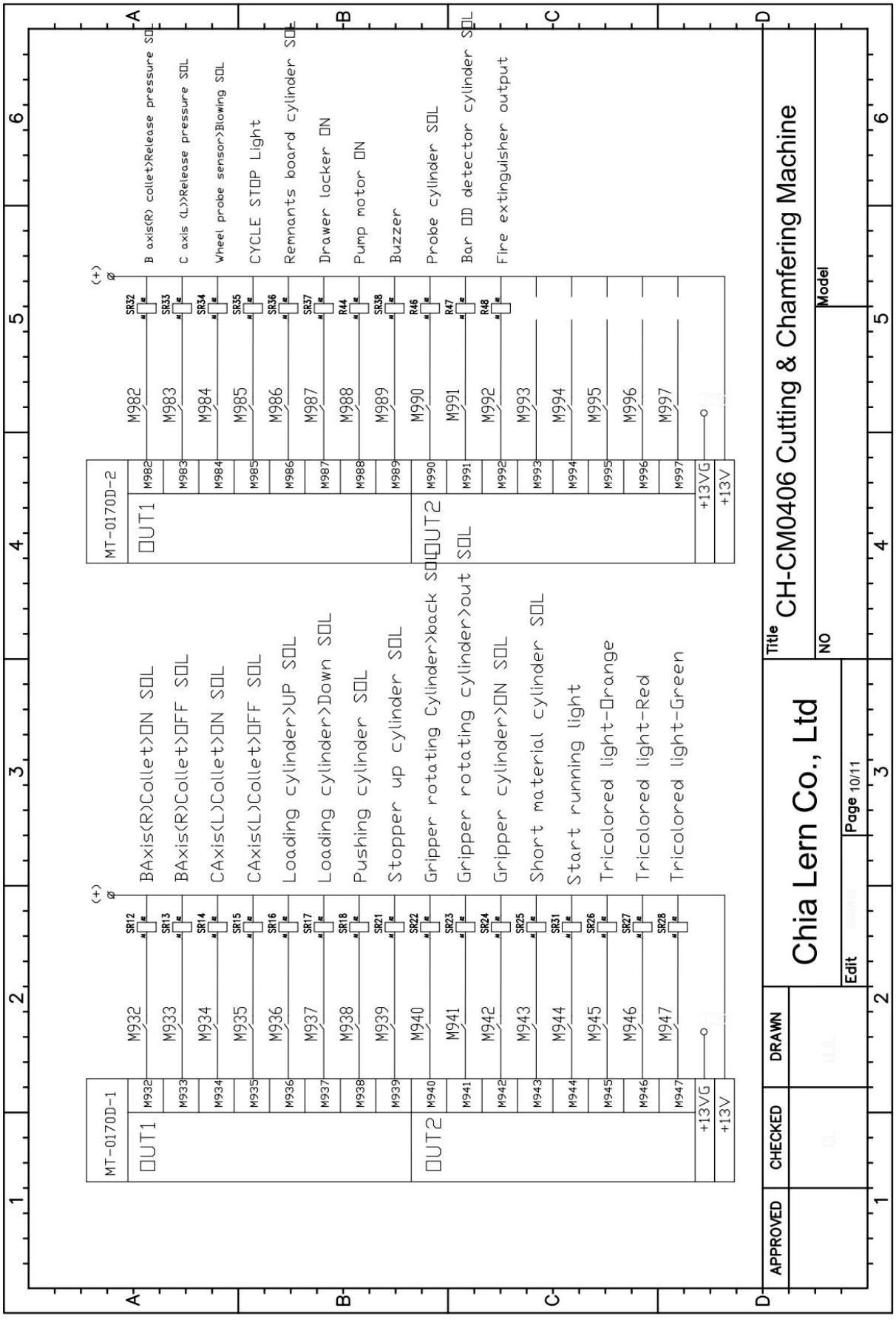

MT-0170D NO.2
MT-0170D NO.1
M900
M950
*M966 Fire extinguisher ready sensor (Input)
*M992 Fire extinguisher output
*M967 Fire extinguisher ready sensor (Input) / or Short circuit
COM1
COM2
DRIVER1 X axis
DRIVER2 Y axis
DRIVER3 Z axis
DRIVER4 A axis
DRIVER5 B 軸
DRIVER6 C axis
UTC600V
HMI COM2
APPROVED
CHECKED
DRAWN
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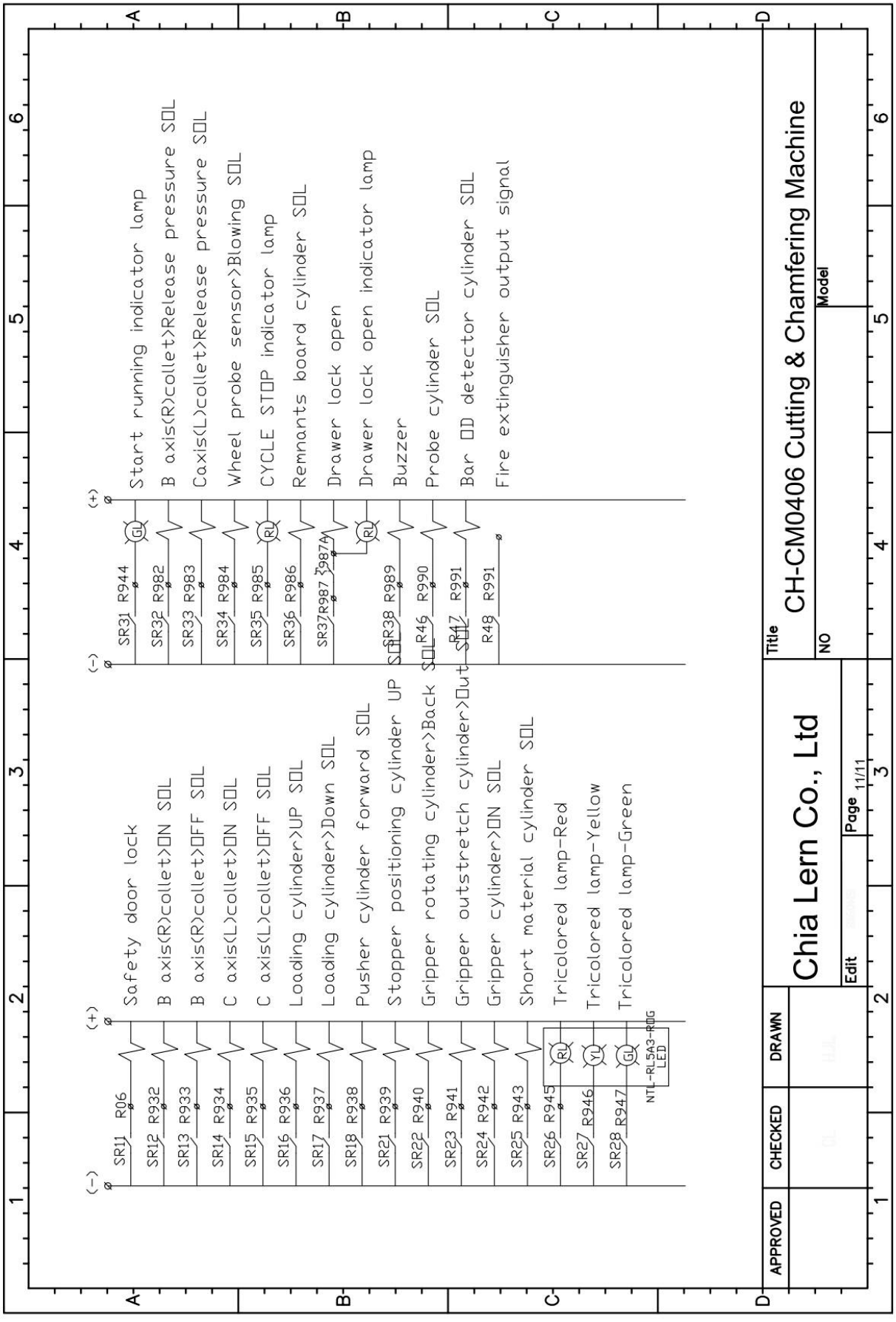

Ø TO INV AVI
wheel speed control
Ø TO INV AFM
Wheel output current
WP speed setting
Panel VR
VR-B502
Ø TO INV ACM
+5V
DA1
DA2
DA3
DA4
-12V
+12V
AD1
AD2
AD3
AD4
0V
J4
A axis positive limited
A axis negative limited+home switch
ALS+
ALS-
PH
+LIM
-LIM
HMF
+V
COM
D4
D5
D6
Demo mode
X axis positive limited
X axis negative limited+home switch
XLS+
XLS-
D1
Y axis positive limited
Y axis negative limited+home switch
YLS+
YLS-
YHM
Black
Orange
P2EDB-DU
Wheel OD probe PH
D2
Z axis positive limited
Z axis negative limited+home switch
ZLS+
ZLS-
D3
APPROVED
CHECKED
DRAWN
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UTC-600V
J1
M01
M02
M03
M04
M05
M06
M07
M08
COM
TO INV FWD
wheel motor RUN
Coolant motor ON
Oil mist motor ON
Servo motor power ON
Safety door lock
Power off control
Lamp ON
R41
R42
R43
SR11
DR1
R45
(+)
(-)
UTC-600V
J2
M11
M12
M13
M14
M15
M16
M17
M18
Start-CUT
Stop
Emergency stop
Mode select Bit0Running 2.One cycle
Mode select Bit8.Step 4.Manual
Speed rate switch Bit0
Speed rate switch Bit1
Speed rate switch Bit2
J3
M21
M22
M23
M24
M25
M26
M27
M28
Axis 0
Axis 1
Axis 2
Amplification 0
Amplification 1
Coolant ON
Dust collector motor ON
Mode sellect ON
Handwheel
MODE:HDW-FCEDS-1M
Light green
Purple
Orange
Gray
Brown-white
Red-white
M23
M24
M25
Handwheel
MPG
MODE:HDW-FBECS-1M
J5
0V
V+
A
A/
B
B/
Red 0V
Brown+5V
Orange A
Yellow A/
Pink B
Green-white B/
APPROVED
CHECKED
DRAWN
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MT-0170D-1
IN1
M900
M901
M902
M903
M904
M905
M906
M907
Wheel motor abnormal
Coolant motor overload
Oil mist motor overload
Rail oil shortage
Air pressure shortage
NO.1 Safety door detector-Open warning
NO.2 Safety door detector-Open warning
Locker 1
Locker 2
IN2
M908
M909
M910
M911
M912
M913
M914
M915
B axis(R)collet ON PX
C axis(L)collet ON PX
Loading rod up PX
Loading waiting check PX
Loading rod down PX
Pushing rod cylinder forward PX
Pushing rod cylinder backward PX
Stopper positioning cylinder up detector PX
IN3
M916
M917
M918
M919
M920
M921
M922
M923
Stopper positioning cylinder down detector PX
Gripper rotating cylinder>frount PX
Gripper rotating cylinder>back PX
Gripper outstretch cylinder>forward PX
Gripper outstretch cylinder>backward PX
Water flowing detector switch
Short material cylinder>Out PX
Short material cylinder>Back PX
MT-0170D-1
IN4
M924
M925
M926
M927
M928
M929
M930
M931
J7
GND
+5V
+13VG
+13V
Handwheel
MODEL:HD-W-FBECS-1M
F1 black
F2 Red-black
F3 blue
F4 Gray-black
F5 yellow
F6 green
orange-white
F1:B(R)axis WP collet
F2:C(L)axis WP collet
F3:Pusher cylinder
F4:Stopper positioning cylinder
F5:Gripper rotating cylinder
F6:Gripper outstretch cylinder
Long guide detector switch
Loading detector switch
FESTO
BK
BR
BL
APPROVED
CHECKED
DRAWN
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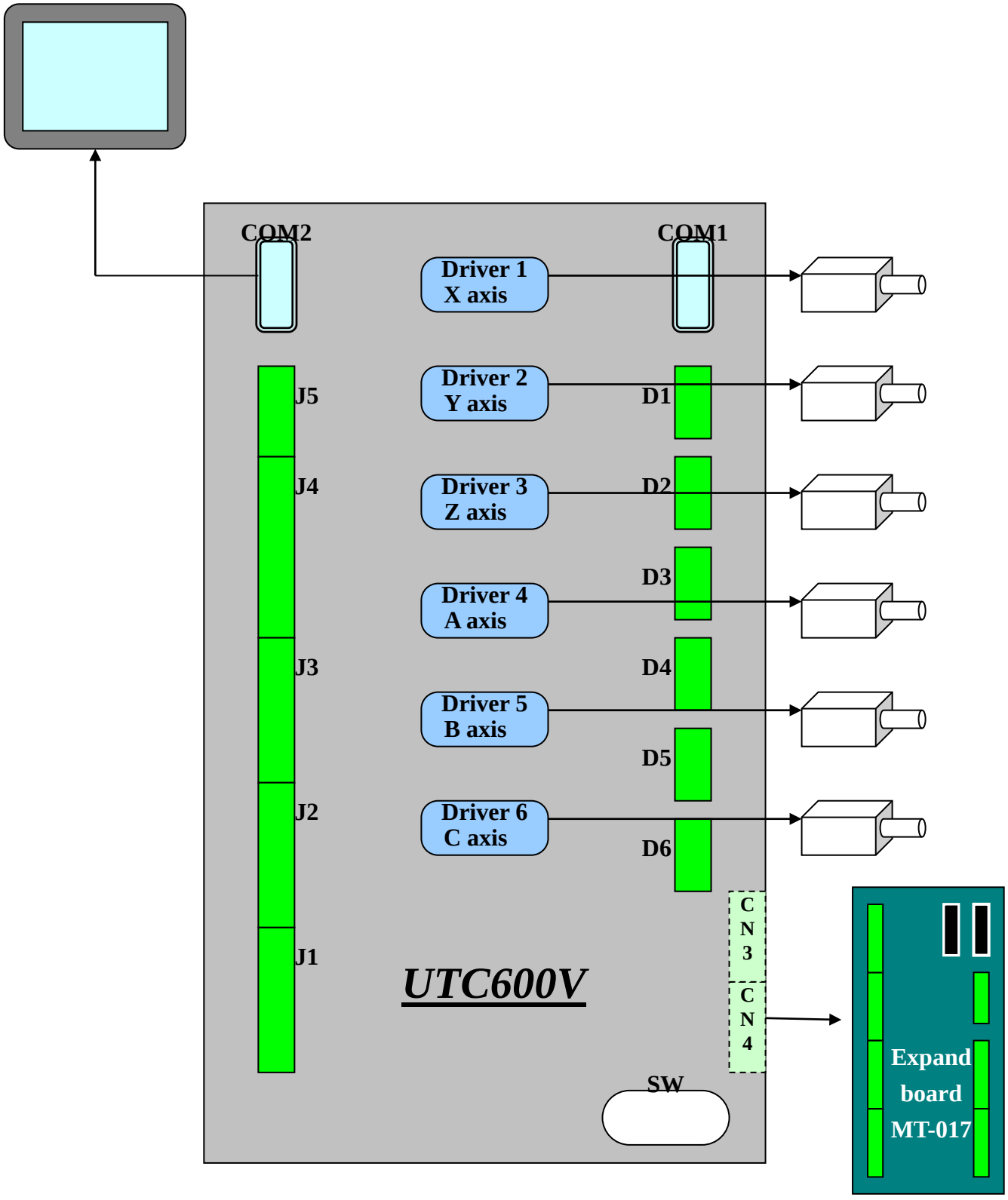

MT-0170D-2
IN1
IN2
IN3
IN4
J7
JOG switch:X+
JOG switch:X-
JOG switch:Y+
JOG switch:Y-
JOG switch:Z+
JOG switch:Z-
JOG switch:A+
JOG switch:A-
Remnants board Cylinder>Out PX
Remnants board Cylinder>Back PX
INTERRUPT RESET PB
Handwheel switch
Drawer detector PX
Probe cylinder Sensor-Fromt
Probe cylinder Sensor-Back
Bar OD detector cylinder>UP PX
Fire extinguisher start signal
Fire extinguisher ready signal
Coolant level detecting-LOW
Coolant level detecting-MID
Coolant level detecting-HIGH
GND
+5V
+13VG
+13V
Chia Lern Co., Ltd
CH-CM0406 Cutting & Chamfering Machine
APPROVED
CHECKED
DRAWN
Edit
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NO
Model


MT-0170D-1
OUT1
OUT2
M932
M933
M934
M935
M936
M937
M938
M939
M940
M941
M942
M943
M944
M945
M946
M947
+13VG
+13V
SR12
SR13
SR14
SR15
SR16
SR17
SR18
SR21
SR22
SR23
SR24
SR25
SR31
SR26
SR27
SR28
BAxis(R)Collet>ON SOL
BAxis(R)Collet>OFF SOL
CAxis(L)Collet>ON SOL
CAxis(L)Collet>OFF SOL
Loading cylinder>UP SOL
Loading cylinder>Down SOL
Pushing cylinder SOL
Stopper up cylinder SOL
Gripper rotating Cylinder>back SOL
Gripper rotating cylinder>out SOL
Gripper cylinder>ON SOL
Short material cylinder SOL
Start running light
Tricolored light-Orange
Tricolored light-Red
Tricolored light-Green
MT-0170D-2
OUT1
OUT2
M982
M983
M984
M985
M986
M987
M988
M989
M990
M991
M992
M993
M994
M995
M996
M997
+13VG
+13V
SR32
SR33
SR34
SR35
SR36
SR37
R44
SR38
R46
R47
R48
B axis(R) collet>Release pressure SOL
C axis (L)>Release pressure SOL
Wheel probe sensor>Blowing SOL
CYCLE STOP Light
Remnants board cylinder SOL
Drawer locker ON
Pump motor ON
Buzzer
Probe cylinder SOL
Bar OD detector cylinder SOL
Fire extinguisher output
APPROVED
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Model


Safety door lock
B axis(R)collet>ON SOL
B axis(R)collet>OFF SOL
C axis(L)collet>ON SOL
C axis(L)collet>OFF SOL
Loading cylinder>UP SOL
Loading cylinder>Down SOL
Pusher cylinder forward SOL
Stopper positioning cylinder UP
Gripper rotating cylinder>Back SOL
Gripper outstretch cylinder>Out SOL
Gripper cylinder>ON SOL
Short material cylinder SOL
Tricolored lamp-Red
Tricolored lamp-Yellow
Tricolored lamp-Green
Start running indicator lamp
B axis(R)collet>Release pressure SOL
Caxis(L)collet>Release pressure SOL
Wheel probe sensor>Blowing SOL
CYCLE STOP indicator lamp
Remnants board cylinder SOL
Drawer lock open
Drawer lock open indicator lamp
Buzzer
Probe cylinder SOL
Bar OD detector cylinder SOL
Fire extinguisher output signal
APPROVED
CHECKED
DRAWN
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Title
CH-CM0406 Cutting & Chamfering Machine
NO
Model
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8. Wire Diagram and Servo Setting

8.1 Servo Setting



8.2 UTC-600V Controller Diagram

Motion Controller UTC-600V Connection Diagram				
Terminal	Definition No.	Description		Remark
J1	+V			
	M01	Wheel Motor		Frequency Converter RUN
	M02	Coolant Motor		ACSSR
	M03	Mist Oil Motor		ACSSR
	M04	Servo AxisON-220V (Actuator BUS Voltage)		ACSSR
	M05			
	M06	**Safety Door Lock ;160719**		DCSSR
	M07	Power off control		DCSSR
	M08	Lighter		ACSSR
	COM			
J2	+V			
	M11	Start		Button
	M12	Stop		Button
	M13	Emergency Stop		Button
	M14	Mode Select Bit-0	MODE： 1. Auto Run 2. Single (One Cycle) 3. Single Step 4. Manual	Mode Select ON/OFF Switch
	M15	Mode Select Bit-1		
	M16	Grind Rate Bit-0	0：OFF ; 1：ON 000 Rate 0% 001 Rate 10% 010 Rate 20% 011 Rate 40% 100 Rate 60% 101 Rate 80% 110 Rate 100% 111 Rate 100%(or 120%)	Feed Rate ON/OFF Switch
	M17	Grind Rate Bit-1		
	M18	Grind Rate Bit-2		
	COM			
J3	+V			Hand Wheel Mode: iHDW-FCEDS-IM
	M21	Hand Wheel –Axis 0	Light Green	InPut
	M22	Hand Wheel–Axis 1	Purple	InPut
	M23	Hand Wheel–Axis 2	Gray	InPut
	M24	Hand Wheel- Rate 0	Brown White	InPut
	M25	Hand Wheel- Rate 1	Red White	InPut
	M26	Coolant Water		ON/OFF Switch
	M27	Mist Oil		ON/OFF Switch
	M28	**Mode Select ;160818**		ON/OFF Switch
	COM	Hand Wheel0V	Orange White	
	+5V			
	DA1	Spindle (Wheel) speed		M81-> Frequency Converter

J4	**DA2**		M82
	DA3		M83
	DA4		M84
	-12V		
	+12V		
	AD1	Spindle (Wheel) Current Value	M105
	AD2	Workpiece axis speed	M205 (Operation panel VR)
	AD3		M305
	AD4		M405
	0V		
J5	**+5V**	Pulse +5V Power Brown	Hand Wheel Mode: iHDW-FBECS-IM New Mode Hand Wheel A/，B/
	A	A Phase Output Brown	
	A/	A/ Phase Output Yellow-Black	
	B	B Phase Output Pink	
	B/	B/ Phase Output Green-White	
	0V	DC 0V Red	
D1	**+LIM**	X Axis Direct Limit	M122
	-LIM	X Axis Negative Limit+Home	M121
	HMF		M120
	+V		
	COM		
D2	**+LIM**	Y Axis Direct Limit	M222
	-LIM	Y Axis Negative Limit+Home	M221
	HMF	**Wheel Detective Sensor**	M220，A=52
	+V		
	COM		
D3	**+LIM**	Z Axis Direct Limit	M322
	-LIM	Z Axis Negative Limit+Home	M321
	HMF		M320
	+V		
	COM		
D4	**+LIM**	A Axis Direct Limit	M422
	-LIM	A Axis Negative Limit+Home	M421
	HMF		M420
	+V		
	COM		
D5	**+LIM**		M522
	-LIM		M521
	HMF		M520
	+V		
	COM		
D6	**+LIM**	**Demo Mode ;160818**	M622
	-LIM		M621
	HMF		M620
	+V		
	COM		

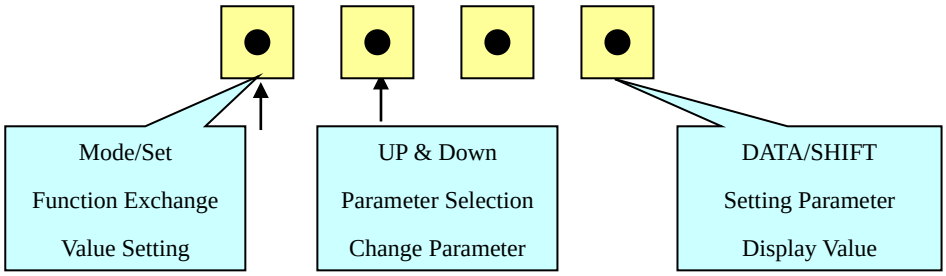
Expansion Board (1) A0170			
Terminal	Definition No.	Description	Remark
IN1	+13V		
	M900	Spindle Motor Alarm	Inverter Alarm=28
	M901	Coolant motor alarm	Solenoid Valve Alarm=29
	M902	Oil mist collector motor alarm	Solenoid Valve Alarm=30
	M903	Lubricator Alarm	Alarm=31
	M904	Air pressure insufficient	Alarm=32
	M905	**Door lock Open alarm ;160719**	Alarm=33
	M906	**Second security door open alarm ;180205**	Alarm=34
	M907		Alarm=35
	+13VG		
IN2	+13V		
	M908	Rigth (B axis) collet alarm-Open Sensor	Sensor，A=36
	M909	Left (C axis) collet alarm-Open Sensor	Sensor，A=37
	M910	Loading-UP alarm Sensor	Sensor，A=38
	M911	Loading-Wait alarm Sensor	Sensor，A=39
	M912	Loading-Down alarm Sensor	Sensor，A=40
	M913	Pusher front alarm-Front Sensor	Sensor，A=41
	M914	Pusher back alarm-Back Sensor	Sensor，A=42
	M915	Stopper alarm-Up Sensor	Sensor，A=43
	+13VG		
IN3	+13V		
	M916	Stopper back alarm-Down Sensor	Sensor，A=44
	M917	Rotate arm UP alarm Sensor	Sensor，A=45
	M918	Rotate arm down alarm Sensor	Sensor，A=46
	M919	Extend arm front alarm Sensor	Sensor，A=47
	M920	Extend arm back alarm Sensor	Sensor，A=48
	M921	Flow switch alarm Sensor	Sensor，A=49
	M922	Short bar loading front alarm Sensor	Sensor，A=50
	M923	Short bar loading back alarm Sensor	Sensor，A=51
	+13VG		
IN4	+13V		
	M924	F1：Right (B axis) collet	HW-Black
	M925	F2：Left (C axis) collet	HW-Red Black
	M926	F3：Pusher Cylinder	HW-Blue
	M927	F4：Stop Cylinder	HW-Gray Black
	M928	F5：Loading arm rotary cylinder	HW-Yellow
	M929	F6：Loading arm stretch out cylinder	HW-Green
	M930	**Guide sleeve sensor**	Sensor，A=54
	M931	**Loading test sensor**	Sensor，A=55
	+13VG		
	+13V		
	M932	Right (B axis) collet –Close	DCSSR
	M933	Right (B axis) collet –Open	DCSSR
	M934	Left (C axis) collet –Close	DCSSR

OUT1	**M935**	Left (C axis) collet –Open	DCSSR
	M936	Loading Cylinder-Up	DCSSR
	M937	Loading Cylinder -Down	DCSSR
	M938	Pusher Cylinder ；ON Front ；OFF Back	DCSSR
	M939	Stop Cylinder ；ON Front ；OFF Back	DCSSR
	+13VG		
OUT2	**+13V**		
	M940	Loading arm rotary cylinder ；ON Down ；OFF Up	DCSSR
	M941	Loading arm stretch out cylinder ；ON Front ；OFF Back	DCSSR
	M942	Loading arm gripper ；ON Grip ；OFF Release	DCSSR
	M943	Short bar loading cylinder ;ON Front ；OFF Back	DCSSR
	M944	**Cycle Start running lighter ;160817**	DCSSR
	M945	Red	DCSSR
	M946	Yellow	DCSSR
	M947	Green	DCSSR
	+13VG		
J7	**GND**		
	+5V		
	+13VG		
	+13V		

Expansion Board (2) A0170			
Description	Description	Description	Remark
IN1	**+13V**		
	M950	Jog；X+	Button
	M951	Jog；X-	Button
	M952	Jog；Y+	Button
	M953	Jog；Y-	Button
	M954	Jog；Z+	Button
	M955	Jog；Z-	Button
	M956	Jog；A+	Button
	M957	Jog；A-	Button
	+13VG		
IN2	**+13V**		
	M958	**Off cut discharge cylinder-Front Sensor ;160817**	Sensor，A=57
	M959	**Off cut discharge cylinder-Back Sensor ;160817**	Sensor，A=58
	M960	**Reset ;160817**	Button
	M961	**HW Safety Button ;160817**	HW Button
	M962	**Loading Door Sensor ;160818**	Sensor，A=59
	M963		InPut
	M964		InPut
	M965		InPut
	+13VG		
IN3	**+13V**		
	M966	Fire extinguisher device activated Sensor ;181121	InPut
	M967	Fire extinguisher device Ready ;190220	InPut
	M968	Water level Sensor(1 low) ;201116	InPut
	M969	Water level Sensor(2 high) ;201116	InPut
	M970	Water level Sensor(3 high high) ;201116	InPut
	M971		InPut
	M972		InPut
	M973		InPut

	+13VG		
IN4	**+13V**		
	M974		InPut
	M975		InPut
	M976		InPut
	M977		InPut
	M978		InPut
	M979		InPut
	M980		InPut
	M981		InPut
	+13VG		
OUT1	**+13V**		
	M982	Right (B axis) collet cylinder- Pressure relief ;160415	DCSSR
	M983	Left (C axis) collet cylinder- Pressure relief ;160415	DCSSR
	M984	**Probe Blow ;160801**	OutPut
	M985	**Cycle Stop indicator ;160818**	OutPut
	M986	**Off cut discharge cylinder ;160817**	OutPut
	M987	**Loading Door Sensor ;160907**	OutPut
	M988		OutPut
	M989		OutPut
	+13VG		
OUT2	**+13V**		
	M990		OutPut
	M991		OutPut
	M992		OutPut
	M993		OutPut
	M994		OutPut
	M995		OutPut
	M996		OutPut
	M997		OutPut
	+13VG		
J7	**GND**		
	+5V		
	+13VG		
	+13V		

8.3 Yaskawa AC SERVER Amplifier Parameter Setting



Parameter：

Parameter	X axis 400W	Y axis 400W	Z axis 400W	A axis 750W	B axis 750W	C axis 750W	Mark
Pn000	0000	0000	0000	0000	0000	0000	
Pn001							
Pn002							
Pn006							
Pn007							
Pn008							
Pn009							
Pn00B	0001	0001	0001	0001	0001	0001	
Pn00C							
Pn010							
Pn100	40.0	40.0	40.0	40.0	100.0	100.0	Speed circuit increase
Pn101	20.00	20.00	20.00	20.00	5.00	5.00	Speed circuit integration of time constant (ms)
Pn102							Position circuit increase
Pn103	100	100	100	100	100 (~150%)	150	Rotary inertia rate %
Pn104							
Pn105							
Pn106							
Pn10A							
Pn10B							
Pn10C							
Pn10D							
Pn10E							
Pn14A							
Pn14B							
Pn14F							
Pn160							
Pn161							
Pn162							
Pn163							
Pn164							
Pn165							

Pn170	1400	1400	1400	1400	1400	1400	
Pn212	2000	2000	2000	2000	2000	2000	
Pn300	10.00	10.00	10.00	10.00	10.00	10.00	
Pn301							
Pn302							
Pn303							
Pn304							
Pn305							
Pn306							
Pn307	40	40	40	40	40	40	
Pn310							
Pn311							
Pn312							
Pn324							
Pn50A	8100	8100	8100	8100	8100	8100	
Pn50B	6548	6548	6548	6548	6548	6548	

8.4 Delta Inverters Parameter setting

Parameter	Setting Value	Function	Remark
00-09	00		
01-00	100		
01-09	3.0		
01-10	3.0		
02-00	1		
02-01	1		
02-10	1		
03-05	1		

9. Actuator of Servo Motor Alarm Number

Troubleshooting Warming

A.F50 Servomotor Main Circuit Cable Disconnection

Apply for actuator：Σ -7 General Type、M-II Communication Type、M-III Communication Type、Ether CAT Communication Type

A.F50: Servomotor Main Circuit Cable Disconnection (The Servomotor did not operate or power was not supplied to the Servomotor even though the SV_ON (Servo ON) command was input when the Servomotor was ready to receive it.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.
	The wiring is not correct or there is a faulty contact in the motor wiring.	Check the wiring.	Make sure that the Servomotor is correctly wired.

A.04A Parameter Setting Error 2

Apply for actuator： M-II / M-III / Ether CAT Communication Type

A.04A: Parameter Setting Error 2	For 4-byte parameter bank members, there are two consecutive members with nothing registered.	–	Change the number of bytes for bank members to an appropriate value.
	The total amount of bank data exceeds 64 (Pn900 × Pn901 > 64).	–	Reduce the total amount of bank data to 64 or less.

A.020 Parameter Checksum Error

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.020: Parameter Checksum Error (There is an error in the parameter data in the SERVOPACK.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	Set the power supply voltage within the specified range, and initialize the parameter settings.
	The power supply was shut OFF while writing parameter settings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.
	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were frequently changed from the host controller.	The SERVOPACK may be faulty. Replace the SERVOPACK. Reconsider the method for writing the parameters.
	A malfunction was caused by noise from the AC power supply, ground, static electricity, or other source.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, noise may be the cause.	Implement countermeasures against noise.
	Gas, water drops, or cutting oil entered the SERVOPACK and caused failure of the internal components.	Check the installation conditions.	The SERVOPACK may be faulty. Replace the SERVOPACK.
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.021 Parameter Format Error

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.021: Parameter Format Error (There is an error in the parameter data format in the SERVOPACK.)	The software version of the SERVOPACK that caused the alarm is older than the software version of the parameters specified to write.	Read the product information to see if the software versions are the same. If they are different, it could be the cause of the alarm.	Write the parameters from another SERVOPACK with the same model and the same software version, and then turn the power OFF and ON again.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.022 System Checksum Error

A.022: System Check-sum Error (There is an error in the parameter data in the SERVOPACK.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SERVOPACK.
	The power supply was shut OFF while setting a utility func-tion.	Check the timing of shutting OFF the power supply.	The SERVOPACK may be faulty. Replace the SERVOPACK.
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.024 System Alarm

A.024: System Alarm (An internal pro-gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.025 System Alarm

A.025: System Alarm (An internal pro-gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.030 Main Circuit Detector Error

A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.040 Parameter Setting Error

A.040: Parameter Setting Error (A parameter setting is outside of the setting range.)	The SERVOPACK and Servomotor capacities do not match each other.	Check the combination of the SERVOPACK and Servomotor capacities.	Select a proper combination of SERVOPACK and Servomotor capacities.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.
	A parameter setting is outside of the setting range.	Check the setting ranges of the parameters that have been changed.	Set the parameters to values within the setting ranges.
	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the following range: 0.001 < (Pn20E/Pn210) < 64,000.	Set the electronic gear ratio in the following range: 0.001 < (Pn20E/ Pn210) < 64,000.

A.041 Encoder Output Pulse Setting Error

A.041: Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting conditions.	Check the setting of Pn212 or Pn281.	Set Pn212 or Pn281 to an appropriate value.

A.042 Parameter Combination Error

A.042: Parameter Combination Error	The speed of program jogging went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions*1 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).
	The speed of program jogging went below the setting range when Pn533 or Pn585 (Program Jogging Movement Speed) was changed.	Check to see if the detection conditions*1 are satisfied.	Increase the setting of Pn533 or Pn585.
	The movement speed of advanced autotuning went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.044 Semi-Closed/Fully-Closed Loop Control Parameter Setting Error

A.044: Semi-Closed/ Fully-Closed Loop Control Parameter Setting Error	The setting of the Fully-Closed Module does not match the setting of Pn002 = n.X□□□ (External Encoder Usage).	Check the setting of Pn002 = n.X□□□.	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = n.X□□□.

A.050 Combination Error

A.050: Combination Error (The capacities of the SERVOPACK and Servomotor do not match.)	The SERVOPACK and Servomotor capacities do not match each other.	Check the capacities to see if they satisfy the following condition: $1/4 \leq \frac{\text{Servomotor capacity}}{\text{SERVOPACK capacity}} \leq 4$	Select a proper combination of the SERVOPACK and Servomotor capacities.
	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	Replace the Servomotor or encoder.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.051 Unsupported Device Alarm

A.051: Unsupported Device Alarm	The motor parameter file was not written to the linear encoder. (This applies only when not using a Serial Converter Unit.)	Check to see if the motor parameter file was written to the linear encoder.	Write the motor parameter file to the linear encoder.
	An unsupported Serial Converter Unit or encoder (e.g., an external encoder) is connected to the SERVOPACK.	Check the product combination specifications.	Change to a correct combination of models.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.070 Motor Type Change Detected

A.070: Motor Type Change Detected (The connected motor is a different type of motor from the previously connected motor.)	A Rotary Servomotor was removed and a Linear Servomotor was connected.	–	Set the parameters for a Linear Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.
	A Linear Servomotor was removed and a Rotary Servomotor was connected.	–	Set the parameters for a Rotary Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.

A.080 Linear Encoder Pitch Setting Error

A.080: Linear Encoder Pitch Setting Error	The setting of Pn282 (Linear Encoder Scale Pitch) has not been changed from the default setting.	Check the setting of Pn282.	Correct the setting of Pn282.

A.0b0 Invalid Servo ON Command Alarm

A.0b0: Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	–	Turn the power supply to the SERVOPACK OFF and ON again. Or, execute a software reset.

A.100 Overcurrent Detected

A.100: Overcurrent Detected (An overcurrent flowed through the power transistor or the heat sink overheated.)	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.
	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, and W.	The cable may be short-circuited. Replace the cable.
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Replace the Servomotor.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.300 Regeneration Error

A.300: Regeneration Error	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not connected to one of the following SERVOPACKs: SGD7S-R70A, -R90A,-1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or set Pn600 (Regenerative Resistor Capacity) to 0 (setting unit: ×10 W) if no Regenerative Resistor is required.
	An External Regenerative Resistor is not connected to one of the following SERVOPACKs: SGD7S-470A, -550A, -590A, or -780A.	Check to see if an External Regenerative Resistor or a Regenerative Resistor Unit is connected and check the setting of Pn600.	Connect an External Regenerative Resistor and set Pn600 to an appropriate value, or connect a Regenerative Resistor Unit and set Pn600 to 0.
	The jumper between the regenerative resistor terminals (B2 and B3) was removed from one of the following SERVOPACKs: SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, or -330A.	Check to see if the jumper is connected between power supply terminals B2 and B3.	Correctly connect a jumper.
	The External Regenerative Resistor is not wired correctly, or was removed or disconnected.	Check the wiring of the External Regenerative Resistor.	Correct the wiring of the External Regenerative Resistor.
	A failure occurred in the SERVOPACK.	–	While the main circuit power supply is OFF, turn the control power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.320 Regenerative Overload

A.320: Regenerative Overload	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	The external regenerative resistance value or regenerative resistor capacity is too small, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the SigmaJunmaSize+ Capacity Selection Software or other means.	Change the regenerative resistance value or capacity. Reconsider the operating conditions using the SigmaJunmaSize+ Capacity Selection Software or other means.
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Servomotor during operation.	Reconsider the system including the servo, machine, and operating conditions.
	The setting of Pn600 (Regenerative Resistor Capacity) is smaller than the capacity of the External Regenerative Resistor.	Check to see if a Regenerative Resistor is connected and check the setting of Pn600.	Correct the setting of Pn600.
	The setting of Pn603 (Regenerative Resistance) is smaller than the capacity of the External Regenerative Resistor.	Check to see if a Regenerative Resistor is connected and check the setting of Pn603.	Correct the setting of Pn603.
	The external regenerative resistance is too high.	Check the regenerative resistance.	Change the regenerative resistance to a correct value or use an External Regenerative Resistor of an appropriate capacity.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.330 Main Circuit Power Supply Wiring Error

A.330: Main Circuit Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	The regenerative resistor was disconnected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measuring instrument.	If you are using the regenerative resistor built into the SERVOPACK, replace the SERVOPACK. If you are using an External Regenerative Resistor, replace the External Regenerative Resistor.
	DC power was supplied when an AC power supply input was specified in the settings.	Check the power supply to see if it is a DC power supply.	Correct the power supply setting to match the actual power supply.
	AC power was supplied when a DC power supply input was specified in the settings.	Check the power supply to see if it is an AC power supply.	Correct the power supply setting to match the actual power supply.
	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not connected to one of the following SERVOPACKs: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or if an External Regenerative Resistor is not required, set Pn600 to 0.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.400 Overvoltage

A.400: Overvoltage (Detected in the main circuit power supply section of the SERVOPACK.)	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the AC/DC power supply voltage within the specified range.
	The power supply is not stable or was influenced by a lightning surge.	Measure the power supply voltage.	Improve the power supply conditions, install a surge absorber, and then turn the power supply OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.
	The voltage for AC power supply was too high during acceleration or deceleration.	Check the power supply voltage and the speed and torque during operation.	Set the AC power supply voltage within the specified range.
	The external regenerative resistance is too high for the operating conditions.	Check the operating conditions and the regenerative resistance.	Select a regenerative resistance value that is appropriate for the operating conditions and load.
	The moment of inertia ratio or mass ratio exceeded the allowable value.	Check to see if the moment of inertia ratio or mass ratio is within the allowable range.	Increase the deceleration time, or reduce the load.
	A failure occurred in the SERVOPACK.	–	While the main circuit power supply is OFF, turn the control power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.410 Under voltage

A.410: Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.)	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.
	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.
	The SERVOPACK fuse is blown out.	–	Replace the SERVOPACK and connect a reactor to the DC reactor terminals (⊖1 and ⊖2) on the SERVOPACK.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.510 Overspeed

A.510: Overspeed (The motor exceeded the maximum speed.)	The order of phases U, V, and W in the motor wiring is not correct.	Check the wiring of the Servomotor.	Make sure that the Servomotor is correctly wired.
	A reference value that exceeded the overspeed detection level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.
	The motor exceeded the maximum speed.	Check the waveform of the motor speed.	Reduce the speed reference input gain and adjust the servo gain. Or, reconsider the operating conditions.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.511 Encoder Output Pulse Overspeed

A.511: Encoder Output Pulse Overspeed	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution).
	The encoder output pulse frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse setting and the motor speed.	Reduce the motor speed.

A.520 Vibration Alarm

A.520: Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Check for abnormal motor noise, and check the speed and torque waveforms during operation.	Reduce the motor speed. Or, reduce the setting of Pn100 (Speed Loop Gain).
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.
	The vibration detection level (Pn312 or Pn384) is not suitable.	Check that the vibration detection level (Pn312 or Pn384) is suitable.	Set a suitable vibration detection level (Pn312 or Pn384).

A.521 Autotuning Alarm

A.521: Autotuning Alarm (Vibration was detected while executing the custom tuning, Easy FFT, or the tuning-less function.)	The Servomotor vibrated considerably while performing the tuning-less function.	Check the waveform of the motor speed.	Reduce the load so that the moment of inertia ratio is within the allowable value. Or increase the load level or reduce the rigidity level in the tuning-less level settings.
	The Servomotor vibrated considerably while performing custom tuning or Easy FFT.	Check the waveform of the motor speed.	Check the operating procedure of corresponding function and implement corrections.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.550 Maximum Speed Setting Error

A.550: Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum speed.	Check the setting of Pn385, and the upper limits of the maximum motor speed setting and the encoder output resolution setting.	Set Pn385 to a value that does not exceed the maximum motor speed.

A.710 Instantaneous Overload/A.720 Continuous Overload

A.710: Instantaneous Overload A.720: Continuous Overload	The wiring is not correct or there is a faulty contact in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.
	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.
	An excessive load was applied during operation because the Servomotor was not driven due to mechanical problems.	Check the operation reference and motor speed.	Correct the mechanical problem.
	There is an error in the setting of Pn282 (Linear Encoder Scale Pitch).	Check the setting of Pn282.	Correct the setting of Pn282.
	There is an error in the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection).	Check the setting of Pn080 = n.□□X□.	Set Pn080 = n.□□X□ to an appropriate value.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.730/A.731 Dynamic Brake Overload

A.730 and A.731: Dynamic Brake Overload (An excessive power consumption by the dynamic brake was detected.)	The Servomotor was rotated by an external force.	Check the operation status.	Implement measures to ensure that the motor will not be rotated by an external force.
	When the Servomotor was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: • Reduce the Servomotor command speed. • Decrease the moment of inertia ratio or mass ratio. • Reduce the frequency of stopping with the dynamic brake.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.740 Lnrush Current Limiting Resistor Overload

A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply was frequently turned ON and OFF.)	The allowable frequency of the inrush current limiting resistor was exceeded when the main circuit power supply was turned ON and OFF.	–	Reduce the frequency of turning the main circuit power supply ON and OFF.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.7A1 Internal Temperature Error 1

A.7A1: Internal Temperature Error 1 (Control Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.7A2_ Internal Temperature Error 2(Σ -7)

A.7A2: Internal Temperature Error 2 (Power Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.7A3 Internal Temperature Sensor Error

A.7A3: Internal Temperature Sensor Error (An error occurred in the temperature sensor circuit.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.7AB SERVORPACK Built-in Fan Stopped

A.7Ab: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.810 Encoder Backup Alarm

A.810: Encoder Backup Alarm (Detected at the encoder, but only when an absolute encoder is used.)	The power to the absolute encoder was turned ON for the first time.	Check to see if the power supply was turned ON for the first time.	Set up the encoder.
	The Encoder Cable was disconnected and then connected again.	Check to see if the power supply was turned ON for the first time.	Check the encoder connection and set up the encoder.
	Power is not being supplied both from the control power supply (+5 V) from the SERVOPACK and from the battery power supply.	Check the encoder connector battery and the connector status.	Replace the battery or implement similar measures to supply power to the encoder, and set up the encoder.
	A failure occurred in the absolute encoder.	–	If the alarm still occurs after setting up the encoder again, replace the Servomotor.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.820 Encoder Checksum Alarm

A.820: Encoder Checksum Alarm (Detected at the encoder.)	A failure occurred in the encoder.	–	■ When Using an Absolute Encoder Set up the encoder again. If the alarm still occurs, the Servomotor may be faulty. Replace the Servomotor. ■ When Using a Single-turn Absolute Encoder or Incremental Encoder • The Servomotor may be faulty. Replace the Servomotor. • The linear encoder may be faulty. Replace the linear encoder.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.830 Encoder Battery Alarm

A.830: Encoder Battery Alarm (The absolute encoder battery voltage was lower than the specified level.)	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.
	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.840 Encoder Data Alarm

A.840: Encoder Data Alarm (Detected at the encoder.)	The encoder malfunctioned.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	An error occurred in reading data from the linear encoder.	–	The linear encoder is not mounted within an appropriate tolerance. Correct the mounting of the linear encoder.
	Excessive speed occurred in the linear encoder.	–	Control the motor speed within the range specified by the linear encoder manufacturer and then turn ON the control power supply.
	The encoder malfunctioned due to noise.	–	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.
	The polarity sensor is not wired correctly.	Check the wiring of the polarity sensor.	Correct the wiring of the polarity sensor.
	The polarity sensor failed.	–	Replace the polarity sensor.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.850 Encoder Overspeed

A.850: Encoder Overspeed (Detected at the encoder when the control power supply is turned ON.)	Rotary Servomotor: The Servomotor speed was 200 min^{-1} or higher when the control power supply was turned ON.	Check the motor speed when the power supply is turned ON.	Reduce the Servomotor speed to a value less than 200 min^{-1}, and turn ON the control power supply.
	Linear Servomotor: The Servomotor exceeded the specified speed when the control power supply was turned ON.	Check the motor speed when the power supply is turned ON.	Control the motor speed within the range specified by the linear encoder manufacturer and then turn ON the control power supply.
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.860 Encoder Overheated

A.860: Encoder Overheated (Detected when a Rotary Servomotor, Absolute Linear Encoder, or Direct Drive Servomotor is connected. However, this alarm is not detected for SGMCS Servomotors with Incremental Encoders.) (Detected at the encoder.)	The surrounding air temperature around the Servomotor is too high.	Measure the surrounding air temperature around the Servomotor.	Reduce the surrounding air temperature of the Servomotor to 40°C or less.
	The Servomotor load is greater than the rated load.	Use the accumulated load ratio to check the load.	Operate the Servo Drive so that the motor load remains within the specified range.
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or absolute linear encoder may be faulty. Replace the Servomotor or absolute linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.861 Motor Overheated

A.861: Motor Overheated	The surrounding temperature around the Servomotor is too high.	Measure the surrounding temperature around the Servomotor.	Reduce the surrounding air temperature of the Servomotor to 40°C or less.
	The motor load is greater than the rated load.	Check the load with the accumulated load ratio on the Motion Monitor Tab Page on the SigmaWin+.	Operate the Servo Drive so that the motor load remains within the specified range.
	A failure occurred in the Serial Converter Unit.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Serial Converter Unit may be faulty. Replace the Serial Converter Unit.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.890 Encoder Scale Error

A.890: Encoder Scale Error	A failure occurred in the linear encoder.	–	The linear encoder may be faulty. Replace the linear encoder.

A.891 Encoder Module Error

A.891: Encoder Module Error	A failure occurred in the linear encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the linear encoder may be faulty. Replace the linear encoder.

A.8A0 External Encoder Error

A.8A0: External Encoder Error	Setting the origin of the absolute linear encoder failed because the motor moved.	Before you set the origin, use the fully-closed feedback pulse counter to confirm that the motor is not moving.	The motor must be stopped while setting the origin position.
	A failure occurred in the external encoder.	–	Replace the external encoder.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.8A1 External Encoder Module Error

A.8A1: External Encoder Module Error	A failure occurred in the external encoder.	–	Replace the external encoder.
	A failure occurred in the Serial Converter Unit.	–	Replace the Serial Converter Unit.

A.8A2 External Incremental Encoder Sensor Error

A.8A2: External Incremental Encoder Sensor Error	A failure occurred in the external encoder.	–	Replace the external encoder.

A.8A3 External Absolute Encoder Position Error

A.8A3: External Absolute Encoder Position Error	A failure occurred in the external absolute encoder.	–	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrections.

A.8A5 External Encoder Overspeed

A.8A5: External Encoder Overspeed	An overspeed error was detected in the external encoder.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.

A.8A6 External Encoder Overheated

A.8A6: External Encoder Overheated	An overheating error was detected in the external encoder.	–	Replace the external encoder.

A.b10 Speed Reference A/D Error

A.b10: Speed Reference A/D Error (Detected when the servo is ON.)	A malfunction occurred in the speed reference input section.	–	Clear and reset the alarm and restart the operation.
	A SERVOPACK fault occurred.	–	Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.b11 Speed Reference A/D Data Error

A.b11: Speed Reference A/D Data Error	A malfunction occurred in the speed reference input section.	–	Clear and reset the alarm and restart the operation.
	A SERVOPACK fault occurred.	–	Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.20 Reference Torque Input Read Error

A.b20: Reference Torque Input Read Error (Detected when the servo is ON.)	A malfunction occurred in the reading section of the torque reference input.	–	Clear and reset the alarm and restart the operation.
	A SERVOPACK fault occurred.	–	Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.b33 Current Detection Error 3

A.b33: Current Detection Error 3	A failure occurred in the current detection circuit.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.bF0 System Alarm 0

A.bF0: System Alarm 0	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.bF1 System Alarm 1

A.bF1: System Alarm 1	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.bF2 System Alarm 2

A.bF2: System Alarm 2	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.bF3 System Alarm 3

A.bF3: System Alarm 3	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.bF4 System Alarm 4

A.bF4: System Alarm 4	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.C10 Servomotor Out of Control

A.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servomotor wiring.	Make sure that the Servomotor is correctly wired.
	There is an error in the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection).	Check the setting of Pn080 = n.□□X□.	Set Pn080 = n.□□X□ to an appropriate value.
	A failure occurred in the encoder.	–	If the motor wiring is correct and an alarm still occurs after turning the power supply OFF and ON again, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.C20 Phase Detection Error

A.C20: Phase Detection Error	The linear encoder signal level is too low.	Check the voltage of the linear encoder signal.	Fine-tune the mounting of the scale head. Or, replace the linear encoder.
	The count-up direction of the linear encoder does not match the forward direction of the Moving Coil in the motor.	Check the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection). Check the installation orientation for the linear encoder and Moving Coil.	Change the setting of Pn080 = n.□□X□. Correctly reinstall the linear encoder or Moving Coil.
	The polarity sensor signal is being affected by noise.	–	Correct the FG wiring. Implement countermeasures against noise for the polarity sensor wiring.
	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282 (Linear Encoder Scale Pitch).	Check the specifications of the linear encoder and set a correct value.

A.C21_Polarity Sensor Error(Σ -7)

A.C21: Polarity Sensor Error	The polarity sensor is protruding from the Magnetic Way of the motor.	Check the polarity sensor.	Correctly reinstall the Moving Coil or Magnetic Way of the motor.
	The polarity sensor is not wired correctly.	Check the wiring of the polarity sensor.	Correct the wiring of the polarity sensor.
	The polarity sensor failed.	–	Replace the polarity sensor.

A.C22 Phase Information Disagreement

A.C22: Phase Information Disagreement	The SERVOPACK phase information is different from the linear encoder phase information.	–	Perform polarity detection.

Troubleshooting Warming

Apply for actuator：Σ -7 General Type、M-II / M-III / EtherCAT communication Type

A.C50 Polarity Detection Failure

A.C50: Polarity Detection Failure	The parameter settings are not correct.	Check the linear encoder specifications and feedback signal status.	The settings of Pn282 (Linear Encoder Scale Pitch) and Pn080 = n.□□X□ (Motor Phase Sequence Selection) may not match the installation. Set the parameters to correct values.
	There is noise on the scale signal.	Check to make sure that the frame grounds of the Serial Converter Unit and Servomotor are connected to the FG terminal on the SERVOPACK and that the FG terminal on the SERVOPACK is connected to the frame ground on the power supply. And, confirm that the shield is properly processed on the Linear Encoder Cable. Check to see if the detection reference is repeatedly output in one direction.	Implement appropriate countermeasures against noise for the Linear Encoder Cable.
	An external force was applied to the Moving Coil of the motor.	–	The polarity cannot be properly detected if the detection reference is 0 and the speed feedback is not 0 because of an external force, such as cable tension, applied to the Moving Coil. Implement measures to reduce the external force so that the speed feedback goes to 0. If the external force cannot be reduced, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).
	The linear encoder resolution is too low.	Check the linear encoder scale pitch to see if it is within 100 µm.	If the linear encoder scale pitch is 100 µm or higher, the SERVOPACK cannot detect the correct speed feedback. Use a linear encoder scale pitch with higher resolution. (We recommend a pitch of 40 µm or less.) Or, increase the setting of Pn485 (Polarity Detection Reference Speed). However, increasing the setting of Pn485 will increase the Servomotor movement range that is required for polarity detection.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.C51 Overtravel Detected during Polarity Detection

A.C51: Overtravel Detected during Polarity Detection	The overtravel signal was detected during polarity detection.	Check the overtravel position.	Wire the overtravel signals. Execute polarity detection at a position where an overtravel signal would not be detected.

A.C52 Polarity Detection Not Competed

A.C52: Polarity Detection Not Completed	The servo was turned ON when using an absolute linear encoder, Pn587 was set to n.□□□0 (Do not detect polarity), and the polarity had not been detected.	–	When using an absolute linear encoder, set Pn587 to n.□□□1 (Detect polarity)

A.C53 Out of Range of Motion for Polarity Detection

A.C53: Out of Range of Motion for Polarity Detection	The travel distance exceeded the setting of Pn48E (Polarity Detection Range) in the middle of detection.	–	Increase the setting of Pn48E (Polarity Detection Range). Or, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).

A.C54 Polarity Detection Failure 2

A.C54: Polarity Detection Failure 2	An external force was applied to the Servomotor.	–	Increase the setting of Pn495 (Polarity Detection Confirmation Force Reference). Increase the setting of Pn498 (Polarity Detection Allowable Error Range). Increasing the allowable error will also increase the motor temperature.

Troubleshooting Warming

A.C80 Encoder Clear Error or Multiturn Limit Setting Error

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.C80: Encoder Clear Error or Multiturn Limit Setting Error	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.C90 Encoder Communications Error

A.C90: Encoder Communications Error	There is a faulty contact in the connector or the connector is not wired correctly for the encoder.	Check the condition of the encoder connector.	Reconnect the encoder connector and check the encoder wiring.
	There is a cable disconnection or short-circuit in the encoder. Or, the cable impedance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the specified specifications.
	One of the following has occurred: corrosion caused by improper temperature, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in connector caused by vibration.	Check the operating environment.	Improve the operating environmental, and replace the cable. If the alarm still occurs, replace the SERVOPACK.
	A malfunction was caused by noise.	–	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.
	A failure occurred in the SERVOPACK.	–	Connect the Servomotor to another SERVOPACK, and turn ON the control power supply. If no alarm occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

A.C91 Encoder Communications Position Data Acceleration Rate Error

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.C91: Encoder Communications Position Data Acceleration Rate Error	Noise entered on the signal lines because the Encoder Cable is bent or the sheath is damaged.	Check the condition of the Encoder Cable and connectors.	Check the Encoder Cable to see if it is installed correctly.
	The Encoder Cable is bundled with a high-current line or installed near a high-current line.	Check the installation condition of the Encoder Cable.	Confirm that there is no surge voltage on the Encoder Cable.
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Check the installation condition of the Encoder Cable.	Properly ground the machine to separate it from the FG of the encoder.

A.C92 Encoder Communications Timer Error

Apply for actuator：Σ -7 General Type、M-II /M-III /EtherCAT Communication Type

A.C92: Encoder Communications Timer Error	Noise entered on the signal line from the encoder.	–	Implement countermeasures against noise for the encoder wiring.
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor or linear encoder.
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.CA0 Encoder Parameter Error

A.CA0: Encoder Parameter Error	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.Cb0 Encoder Echoback Error

A.Cb0: Encoder Echoback Error	The encoder is wired incorrectly or there is faulty contact.	Check the wiring of the encoder.	Make sure that the encoder is correctly wired.
	The specifications of the Encoder Cable are not correct and noise entered on it.	–	Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm^2.
	The Encoder Cable is too long and noise entered on it.	–	• Rotary Servomotors: The Encoder Cable wiring distance must be 50 m max. • Linear Servomotors: The Encoder Cable wiring distance must be 20 m max.
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Check the condition of the Encoder Cable and connectors.	Properly ground the machine to separate it from the FG of the encoder.
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor or linear encoder.
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.CC0 Multiturn Limit Disagreement

A.CC0: Multiturn Limit Disagreement	When using a Direct Drive Servomotor, the setting of Pn205 (Multiturn Limit) does not agree with the encoder.	Check the setting of Pn205.	Correct the setting of Pn205 (0 to 65,535).
	The multiturn limit of the encoder is different from that of the SERVOPACK. Or, the multiturn limit of the SERVOPACK has been changed.	Check the setting of Pn205 in the SERVOPACK.	Change the setting if the alarm occurs.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.CF1 Reception Failed Error in Feedback Option Module Communication

A.CF1: Reception Failed Error in Feedback Option Module Communications	The cable between the Serial Converter Unit and SERVOPACK is not wired correctly or there is a faulty contact.	Check the wiring of the external encoder.	Correctly wire the cable between the Serial Converter Unit and SERVOPACK.
	A specified cable is not being used between Serial Converter Unit and SERVOPACK.	Check the wiring specifications of the external encoder.	Use a specified cable.
	The cable between the Serial Converter Unit and SERVOPACK is too long.	Measure the length of the cable that connects the Serial Converter Unit.	The length of the cable between the Serial Converter Unit and SERVOPACK must be 20 m or less.
	The sheath on cable between the Serial Converter Unit and SERVOPACK is broken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Converter Unit and SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.CF2 Timer Stopped Error in Feedbak Option Module Communications

A.CF2: Timer Stopped Error in Feed-back Option Module Commu-nications	Noise entered the cable between the Serial Converter Unit and SERVOPACK.	–	Correct the wiring around the Serial Converter Unit, e.g., separate I/O signal lines from the Main Circuit Cables or ground.
	A failure occurred in the Serial Converter Unit.	–	Replace the Serial Con-verter Unit.
	A failure occurred in the SERVOPACK.	–	Replace the SERVO-PACK.

A.d00 Position Deviation Overflow

A.d00: Position Devia-tion Overflow (The setting of Pn520 (Position Deviation Over-flow Alarm Level) was exceeded by the position devi-ation while the servo was ON.)	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Cir-cuit Cables.	Make sure that there are no faulty contacts in the wiring for the Servomotor and encoder.
	The position com-mand speed is too fast.	Reduce the position command speed and try operating the SERVOPACK.	Reduce the position refer-ence speed or the refer-ence acceleration rate, or reconsider the electronic gear ratio.
	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVO-PACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference accel-eration by selecting the position reference filter (ACCFIL) using a MECHA-TROLINK command.
	The setting of Pn520 (Position Deviation Overflow Alarm Level) is too low for the operating conditions.	Check Pn520 (Position Deviation Overflow Alarm Level) to see if it is set to an appropriate value.	Optimize the setting of Pn520.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.d01 Position Deviation Overflow Alarm at Servo ON

A.d01: Position Deviation Overflow Alarm at Servo ON	The servo was turned ON after the position deviation exceeded the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON) while the servo was OFF.	Check the position deviation while the servo is OFF.	Optimize the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON).

A.d02 Position Deviation Overflow Alarm for Speed Limit at Servo ON

A.d02: Position Deviation Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON) limits the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded.	–	Optimize the setting of Pn520 (Position Deviation Overflow Alarm Level). Or, adjust the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON).

A.d10 Motor-Load Position Deviation Overflow

A.d10: Motor-Load Position Deviation Overflow	The motor direction and external encoder installation orientation are backward.	Check the motor direction and the external encoder installation orientation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.X□□□ (External Encoder Usage) to reverse the direction.
	There is an error in the connection between the load (e.g., stage) and external encoder coupling.	Check the coupling of the external encoder.	Check the mechanical coupling.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.d30 Position Data Overflow

A.d30: Position Data Overflow	The position data exceeded ±1,879,048,192.	Check the input reference pulse counter.	Reconsider the operating specifications.

A.E72 Feedback Option Module Detection Failure

A.E72: Feedback Option Module Detection Failure	There is a faulty connection between the SERVOPACK and the Feedback Option Module.	Check the connection between the SERVOPACK and the Feedback Option Module.	Correctly connect the Feedback Option Module.
	The Feedback Option Module was disconnected.	–	Reset the Option Module configuration error and turn the power supply to the SERVOPACK OFF and ON again.
	A failure occurred in the Feedback Option Module.	–	Replace the Feedback Option Module.
	A failure occurred in the SERVOPACK.	–	Replace the SERVOPACK.

A.Eb1_Safety Function Signal Imput Timing Error(Σ -7)

A.Eb1: Safety Function Signal Input Timing Error	The delay between activation of the /HWBB1 and /HWBB2 input signals for the HWBB was ten second or longer.	Measure the time delay between the /HWBB1 and /HWBB2 signals.	The output signal circuits or devices for /HWBB1 and /HWBB2 or the SERVOPACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check to see if any of these items are faulty or have been disconnected.
	A failure occurred in the SERVOPACK.	–	Replace the SERVOPACK.

Troubleshooting Warming

Apply for actuator : Σ -7 General Type、M-II Communication Type、M-III Communication Type、EtherCAT Communication Type

A.F10 Power Supply Line Open Phase

A.F10: Power Supply Line Open Phase (The voltage was low for more than one second for phase R, S, or T when the main power supply was ON.)	The three-phase power supply wiring is not correct.	Check the power supply wiring.	Make sure that the power supply is correctly wired.
	The three-phase power supply is unbalanced.	Measure the voltage for each phase of the three-phase power supply.	Balance the power supply by changing phases.
	A single-phase power supply was input without specifying a signal-phase AC power supply input (Pn00B = n.□1□□).	Check the power supply and the parameter setting.	Match the parameter setting to the power supply.
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

CPF00 Digital Operator Transmission Error 1

CPF00	Digital Operator Transmission Error 1	The contact between the digital operator and the SERVOPACK is faulty.	Check the connector contact.	Insert securely the connector or replace the cable.
		Malfunction caused by noise interference.	--	Keep the digital operator or the cable away from noise sources.

CPF01 Digital Operator Transmission Error 2

CPF01	Digital Operator Transmission Error 2	A digital operator fault occurred.	--	Disconnect the digital operator and then reconnect it. If the alarm still occurs, the digital operator may be faulty. Replace the digital operator.
		A SERVOPACK fault occurred.	--	Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

A.900 Position Error Overflow

A.900: Position Error Overflow	The servomotor U, V, and W wirings is faulty.	Check the servomotor main circuit cable connection.	Confirm that there is no contact fault in the motor wiring or encoder wiring.
	The SERVOPACK gain is too low.	Check the SERVOPACK gain.	Increase the servo gain by using the function such as advanced autotuning.
	The acceleration of the position reference is too high.	Reduce the reference acceleration, and operate the SERVOPACK.	Reduce the reference acceleration of the position reference using a MECHATROLINK command, or smooth the acceleration of the position reference by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.
	Setting of the excessive position error alarm level (Pn520) is low against the operating condition.	Check the alarm level (Pn520) to see if it is set to an appropriate value.	Set the Pn520 to proper value.
	A SERVOPACK fault occurred.	–	Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

A.901 Position Error Overflow Alarm at Servo ON

A.901: Position Error Overflow Alarm at Servo ON	When the servomotor power is ON, the position error exceeded the parameter setting (Pn526×Pn528/100).	–	Set an appropriate value for the excessive position error warning level at servo ON (Pn528).

A.901 Position Error Overflow Alarm at Servo ON

A.910: Overload (Warning before alarm A.710 or A.720 occurs)	Incorrect wiring or contact fault of servomotor and encoder.	Check the wiring.	Confirm that the servomotor and encoder are correctly wired.
	Operation beyond the overload protection characteristics.	Check the motor overload characteristics and executed run command.	Reconsider the load conditions and operating conditions. Or, increase the motor capacity.
	Excessive load was applied during operation because the servomotor was not driven due to mechanical problems.	Check the executed operation reference and motor speed.	Remove the mechanical problems.
	A SERVOPACK fault occurred.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

Troubleshooting Warming

A.911 Vibration

A.911: Vibration	Abnormal vibration was detected at the motor speed.	Check for abnormal noise from the servomotor, and check the speed and torque waveforms during operation.	Reduce the motor speed or reduce the servo gain by using the function such as one-parameter tuning.
	The moment of inertia ratio (Pn103) value is greater than the actual value or is greatly changed.	Check the moment of inertia ratio.	Set the moment of inertia ratio (Pn103) to an appropriate value.

A.912 Internal Temperature Waring 1

A.912: Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	-
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-

A.913 Internal Temperature Waring 2

A.913: Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	-
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	-

A.920 Regenerative Overload

A.920: Regenerative Overload (Warning before the alarm A.320 occurs)	The power supply voltage exceeds the specified limit.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	Insufficient external regenerative resistance, regenerative resistor capacity, or SERVOPACK capacity. Or, regenerative power has been continuously flowing back.	Check the operating condition or the capacity using the capacity selection Software SigmaJunmaSize+, etc.	Change the regenerative resistance, regenerative resistor capacity, or SERVOPACK capacity. Reconsider the operating conditions using the capacity selection software SigmaJunmaSize+, etc.
	Regenerative power continuously flowed back because negative load was continuously applied.	Check the load to the servomotor during operation.	Reconsider the system including servo drives, machine, and operating conditions.

Troubleshooting Warming

A.921 Dynamic Brake Overload

A.921: Dynamic Brake Overload (Warning before the alarm A.731 occurs)	The servomotor rotates because of external force.	Check the operation status.	Take measures to ensure the servomotor will not rotate because of external force.
	The rotating energy at a DB stop exceeds the DB resistance capacity.	Check the power consumed by DB resistance (Un00B) to see how many times the DB has been used.	Reconsider the following: • Reduce the motor reference speed. • Reduce the moment of inertia ratio. • Reduce the number of times of the DB stop operation.
	A SERVOPACK fault occurred.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.923 SERVOPACK Built-in Fan Stopped

A.923: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

A.930 Absoulte Encoder Battery Error

A.930: Absolute Encoder Battery Error (The absolute encoder battery voltage is lower than the specified value.) * Only when an absolute encoder is connected.	The battery connection is incorrect.	Check the battery connection.	Reconnect the battery.
	The battery voltage is lower than the specified value 2.7 V.	Measure the battery voltage.	Replace the battery.
	A SERVOPACK fault occurred.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.941 Change of Parameter Requires Restart

A.941: Change of Parameters Requires Restart	Parameters that require the restart have been changed.	–	Turn OFF the power and ON again.

A.942 Speed Ripple Compensation Information Disagreement

A.942: Speed Ripple Compensation Information Disagreement	The speed ripple compensation information stored in the encoder does not agree with the speed ripple compensation information stored in the SERVOPACK.	–	Reset the speed ripple compensation value on the SigmaWin+.	*
		–	Set Pn423 to n.□□1□ (Do not detect A.942 alarms). However, changing the setting may increase the speed ripple.	–
		–	Set Pn423 to n.□□□0 (Disable speed ripple compensation). However, changing the setting may increase the speed ripple.	–

A.971 Under-voltage

A.971: Under-voltage	• For 100 VAC SERVOPACKs: The AC power supply voltage is 60 V or less. • For 200-VAC SERVOPACKs: The AC power supply voltage is 140 V or less. • For 400-VAC SERVOPACKs: The AC power supply voltage is 280 V or less.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.
	Occurrence of instantaneous power interruption.	Measure the power supply voltage.	When the instantaneous power cut hold time (Pn509) is set, decrease the setting.
	The SERVOPACK fuse is blown out.	–	Replace the SERVOPACK and connect a reactor to the SERVOPACK.
	A SERVOPACK fault occurred.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.

A.9A0 Overtravel

A.9A0: Overtravel (Overtravel status is detected.)	When the servomotor power is ON, overtravel status is detected.	Check the input signal monitor (Un005) to check the status of the overtravel signals.	Refer to *9.4 Troubleshooting Malfunction Based on Operation and Conditions of the Servomotor*. Even if overtravel signals were not shown by the input signal monitor (Un005), momentary overtravel may have been detected. Take the following precautions. • Do not specify movements that would cause overtravel from the host controller. • Check the wiring of the overtravel signals. • Take countermeasures for noise.

A.9b0 Preventative Maintenance Warning

A.9b0: Preventative Maintenance Warning	One of the consumable parts has reached the end of its service life.	–	Replace the part. Contact your Yaskawa representative for replacement.	*

10. Safety Rules for Electrical Control System

1. Only personnel who are properly trained and have adequate knowledge and skill should undertake all electrical/electronic troubleshooting and repair.
2. Do not alter or bypass protective interlocks.
3. Before starting, read and observe all warning labels.
4. When trouble shooting make sure the power source has been disconnected and main switch has been locked.
5. Take extra precautions in damp areas to protect you from accidental grounding.
6. Before applying power to any equipment it must be established, without a doubt, that all persons are clear.
7. Do not open the electrical control panel unless it is necessary to check the electrical equipment.
8. Do not alter the electrical circuits unless authorized to do so by the manufacturer.
9. When replacing electrical components, make sure they conform to the manufacturer's specifications, including proper color coding.
10. Do not wear metal frame glasses, metallic necklaces or chains while working on any electrical equipment. Also do not wear any ring, watch or bracelet while operating electrical equipment.

11. Daily Maintain and Consumable

To make sure each procedure is in perfect condition, the machine must be maintained frequently.

Table 10.1 Maintaining Table

No.	Item	Work	Frequency	Note
1.	WP Collet	Clean	Everyday	Take out to clean and wear lubricating oil.
2. (*1)	Coolant Oil	Check	Everyday	Check coolant oil quantity and quality.
		Check	6 months	Coolant oil went off by using long term, exchange the oil after using about 1 year.
4	Pressure Boost of Oil Pressure Cylinder	Check	Every Month	When pressure boost is lower than 1/3, please add R32 hydraulic oil to 2/3.
5.	Electric lubricator	Check	Everyday	Check the lubricating oil, if lower than 1/3, please add it.
6	Oil Recyling Tank	Discharge	Everyday	Discharge the oil from oil recycling tank.
7	General Clean	Clean	Every Week	Clean auto loading mechanism. Clean surrounding of machine.
8	WP axis mechanism	Clean	Every Month	Clean mechanism.
9	X.Y. Flexible Cover	Exchange	Every 2 Years	Clean the cutting oil by air blower when finish work everyday and check if machine is abnormal or broken.

*********Supplies**

Table 10.2 Supplies

No	Item	Mode
1.	Rail Lubricating Oil	
2.	Collet	Schaublin 5C Collet
3.	Cutting Wheel	
4.	Chamfering Wheel	
5.	X.Y.A Axis flexible Cover	