



# **CNC-800DM**

CNC Programmable Automatic Double  
Miter-Cutting Band Saw

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(CE Models)

## **Instruction Manual**

*The Pinnacle of Cutting Performance*  
Cosen Machinery Industrial Co., Ltd.

## FROM THE MANUFACTURER

Thank you for your purchase of COSEN's bandsaw machine and your trust in the COSEN brand.

We are excited to have you as our valued customer and look forward as much as you do to the accelerated productivity, long-lasting endurance and superb cost-effectiveness this machine is about to bring to you.

To ensure you are fully utilizing our machine and being advantaged in every possible way, please do take your time and read through this instruction manual.

Any comment or suggestion in making our service better, please do not hesitate to let us know. Thank you again!

### NOTE:

- Read this instruction manual carefully to familiarize yourself with the installation, operation and maintenance of your COSEN bandsaw machine.
- Operate the machine following the procedures described in the manual to prevent personal injuries or machine damage.
- Keep this manual handy and refer to it whenever you are uncertain of how to perform any of the procedures.
- For technical support or parts purchase, please contact your nearest COSEN representative or our service center:

For US, Mexico, and Canada:  
email: [info@cosensaws.com](mailto:info@cosensaws.com)  
phone: 1-704-943-1030  
toll free: 1-877-SAWING1  
fax: 1-704-943-1031

For service in other countries:  
email: [info@cosen.com](mailto:info@cosen.com)  
phone: 886-3-5332143  
fax: 886-3-5348324

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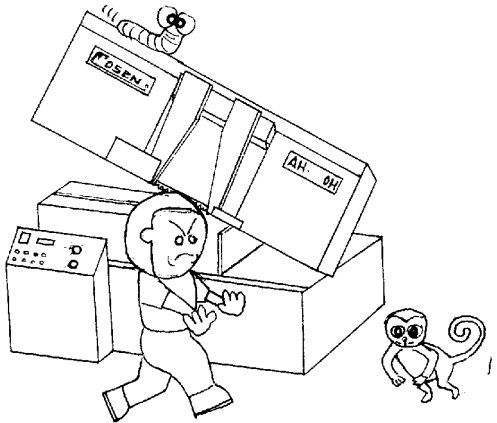
**Instruction Manual: CNC-800DM (CE Models)**  
**CNC Programmable Automatic Double Miter-Cutting Band Saw**  
Ver. 2 2013/10/30

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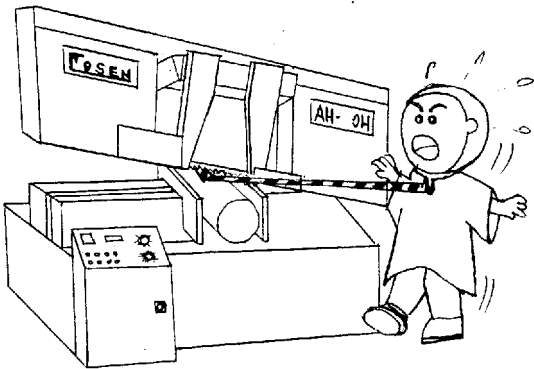
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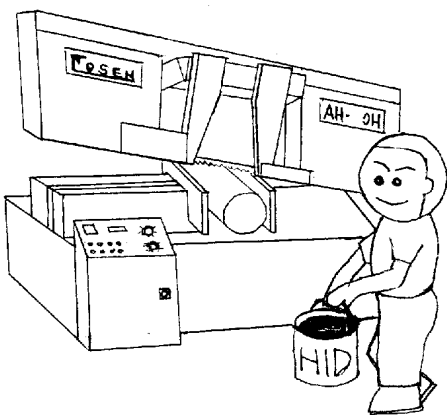
# Safety rules



- Make sure your work area is cleared of uninvited people and obstacles every time before you start operating the machine.

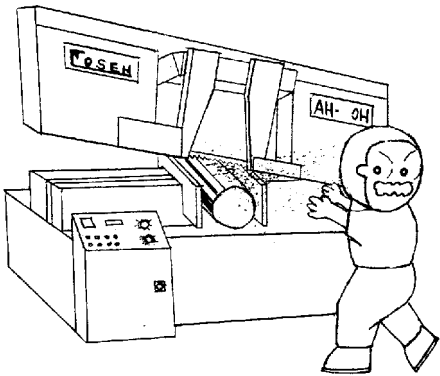


- Never wear gloves or loose clothing when operating the machine. It may lead to serious injury if they are caught in the running machine. Wrap or cover long hair.

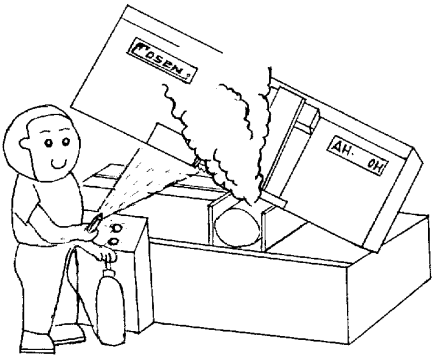


- Use a water-soluble cutting fluid on this machine. Oil-based cutting fluids may emit smoke or catch fire, depending on how they are used.

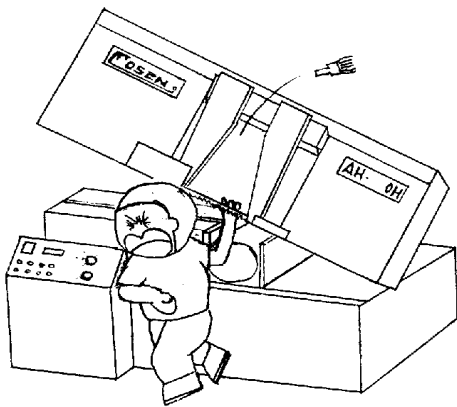
# Safety rules



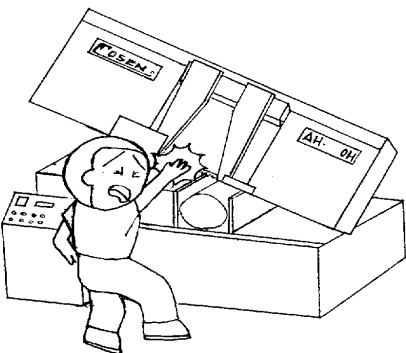
- Never cut carbon or any other material that may produce and disperse explosive dust. It is possible that sparks from motors and other machine parts will ignite and explode the air-borne dust.



- Make sure any use of fire is prohibited in the shop and install a fire extinguisher or other fire control device near the machine when cutting titanium, magnesium, or any other material that produces flammable chips. Never leave the machine unattended when cutting flammable materials.

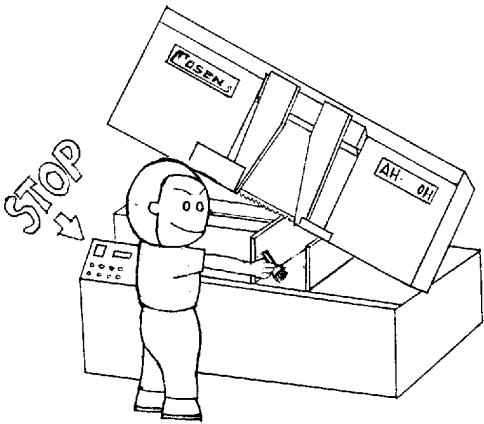


- Never adjust the wire brush or remove chips while the saw blade is still running. It is extremely dangerous if hands or clothing are caught by the running blade.

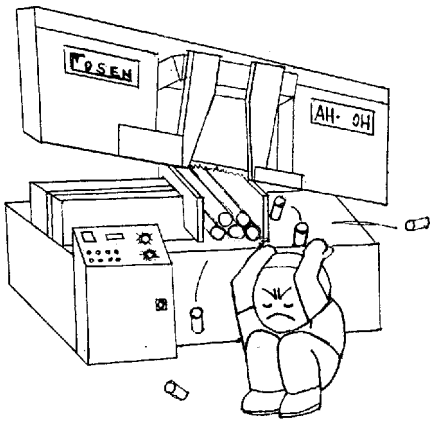


- Never touch the running saw blade with gloves or not. It is dangerous if your hands, clothing or gloves are caught by the running blade.

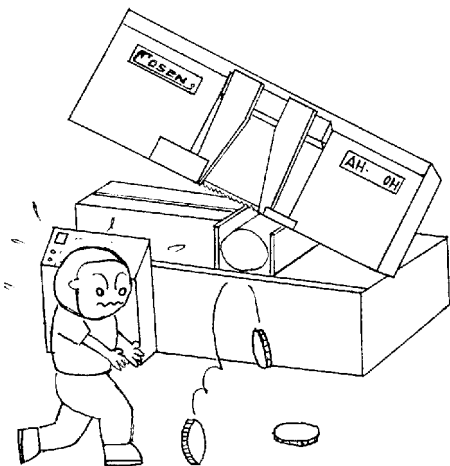
# Safety rules



- Stop the saw blade before you clean the machine. It is dangerous if hands or clothing are caught by the running blade.

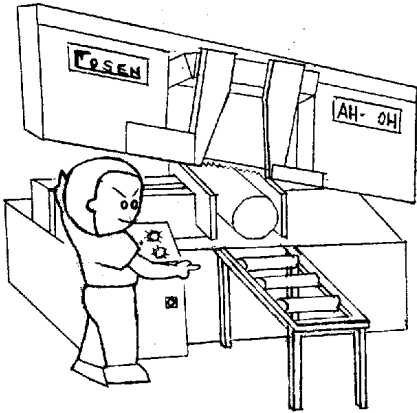


- Never start the saw blade unless the workpiece has been clamped firmly. If the workpiece is not securely clamped, it will be forced out of the vise during cutting.

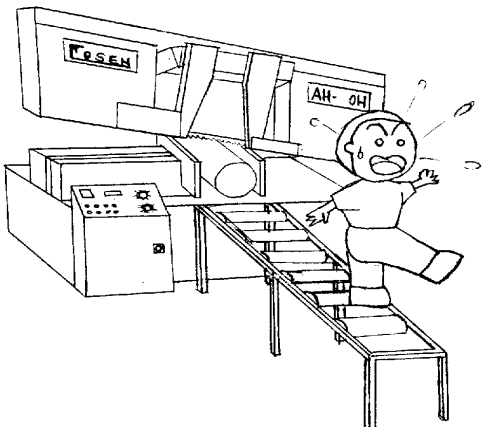


- Take preventive measures when cutting thin or short pieces from the work to keep them from falling. It is dangerous if the cut pieces fall.

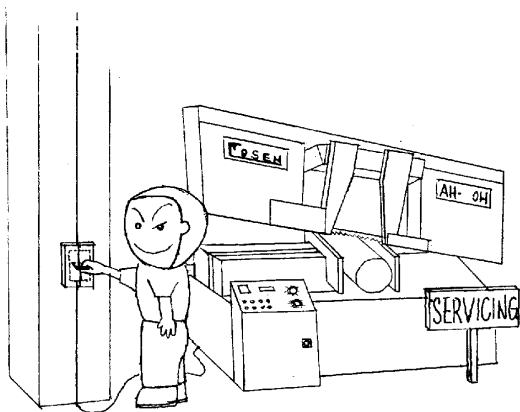
# Safety rules



- Use roller tables at the front and rear sides of the machine when cutting long work. It is dangerous if the work piece falls off the machine.



- Never step or stand on the roller table. Your foot may slip or trip on the rollers and you will fall.



- Turn off the shop circuit breaker switch before performing maintenance on the machine. Post a sign indicating the machine is under maintenance.

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# SAFETY INFORMATION

## SAFETY INSTRUCTIONS

## SAFEGUARD DEVICES

## EMERGENCY STOP

## SAFETY LABELS

## HEARING PROTECTION

## CE COMPLIANCE

## RISK ASSESSMENT

Safety is a combination of a well-designed machine, operator's knowledge about the machine and alertness at all times. COSEN's band machine has incorporated many safety measures during the design process and used protective devices to prevent personal injuries and potential risks. Warning labels also serve as a reminder to the operator.

Throughout this manual, you will also see various safety-related symbols indicating **important information that you should take note of prior to use of the machine or part of its functions**. These important safety instructions do not cover all possible situations that might occur. It is your responsibility to **take caution** and follow procedures stated in this manual when installing, maintaining and operating your machine. Cosen will not be liable for damages resulting from improper use.

## SAFETY INSTRUCTIONS

What the icons and signs in this user manual mean:



This icon marks **DANGER**; hazards or unsafe practices that may result in **severe personal injury or death**.



This icon marks **WARNING**; hazards or unsafe practices that may result in **personal injury or damage to the machine**.



This icon marks **CAUTION**; information that should be read before use to prevent **damage to the machine**.



Supplementary information to the procedures described in this manual.



Call your local agent or our service center for help.



This manual has important safety information. Read through it carefully before operating this machine to prevent personal injury or machine damage. Learn the operation, limitation and the specific potential hazards peculiar to this band saw.



Do not operate this machine unless it is completely assembled.



Make sure the power switch is off before plugging in power cord.



Disconnect the power cord before making adjustment, maintenance or blade changes.



Keep all guards and shields in place before installing or starting up the machine.



Wear proper apparel during operation and when servicing the machine.



Keep unauthorized personnel away.



Do not reach over or stand on any part of the machine.



Never hold the material by hand for cutting. Always use the vise and make sure the material is clamped securely before cutting.



It is dangerous to operate the machine when the floor is slippery. Keep the floor clean and dry. Check for ice, moisture, or grease before entering.



Do not use the machine to cut explosive material or high pressure vessels as it will generate great amount of heat during the sawing process and may ignite an explosion.



Keep the work environment safe. Do not use band saw in a damp or wet location.



Never operate while under the influence of drugs, alcohol or medication.



All users must read it before performing any activity on the machine, such as replacing the saw band or doing regular maintenance.



Some personal protective equipment is required for the safe use of the machine, e.g. protection goggles.



Keep blade protection cover and wheel covers in place and in working order.



Use recommended accessories. Improper accessories may be hazardous.



Keep your work area well illuminated at minimum 500 lumen.



Keep your work area clean. Cluttered and slippery floors invite accidents.



Remove adjusting keys, wrenches **or any loose parts or items** from the machine before turning on power.



Check for damaged parts. Before continuing using the machine, the damaged part should be checked and replaced.



**Moving parts should be kept in proper alignment and connection with the machine.** Check for breakage, mounting and any other conditions that may affect its operation. Any damaged part or guard should be properly repaired or replaced.



When a workpiece is too long or heavy, make sure it is supported with a roller table (recommended).



Always remember to switch off the machine when the work is completed.



Use a sharp saw blade and keep the machine in its best and safest performance by following a periodical maintenance schedule.



Do not force the band saw beyond its intended use. It is safer to operate with the cutting rate for which it was designed.

## SAFEGUARD DEVICES

The safeguard devices incorporated in this machine include the following two main parts:

1. Protection covers & guards
2. Safety-related switches

### **Protection Covers & Guards**

1. Idle wheel housing cover
2. Drive wheel housing cover
3. Gear reducer cover
4. Wire brush belt cover
5. Blade guard cover (left & right)
6. Safety fence (left & right)(CE model only, as shown in Illustration: *Safety Fence*)
7. Chip conveyor cover (CE model only)



The protection devices should always be mounted on the machine whenever the machine is running.



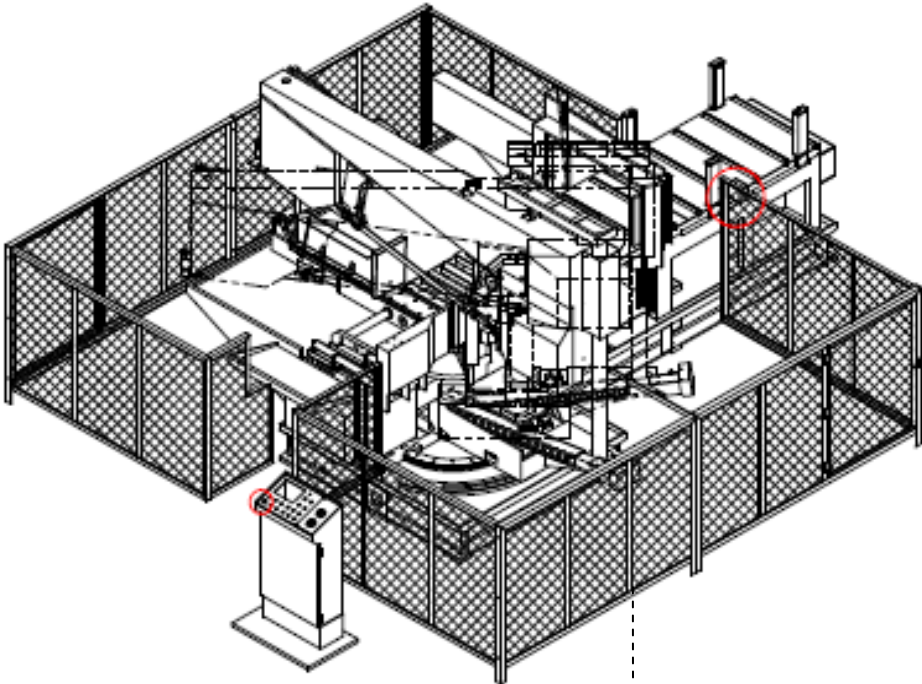
Do not remove any of these safeguard devices under any circumstances except when servicing the machine. Even skilled service technicians should still take cautions when performing repairs or service on the machine with any of these protectors removed. It is the responsibility of the user to make sure all these elements are not lost and damaged.



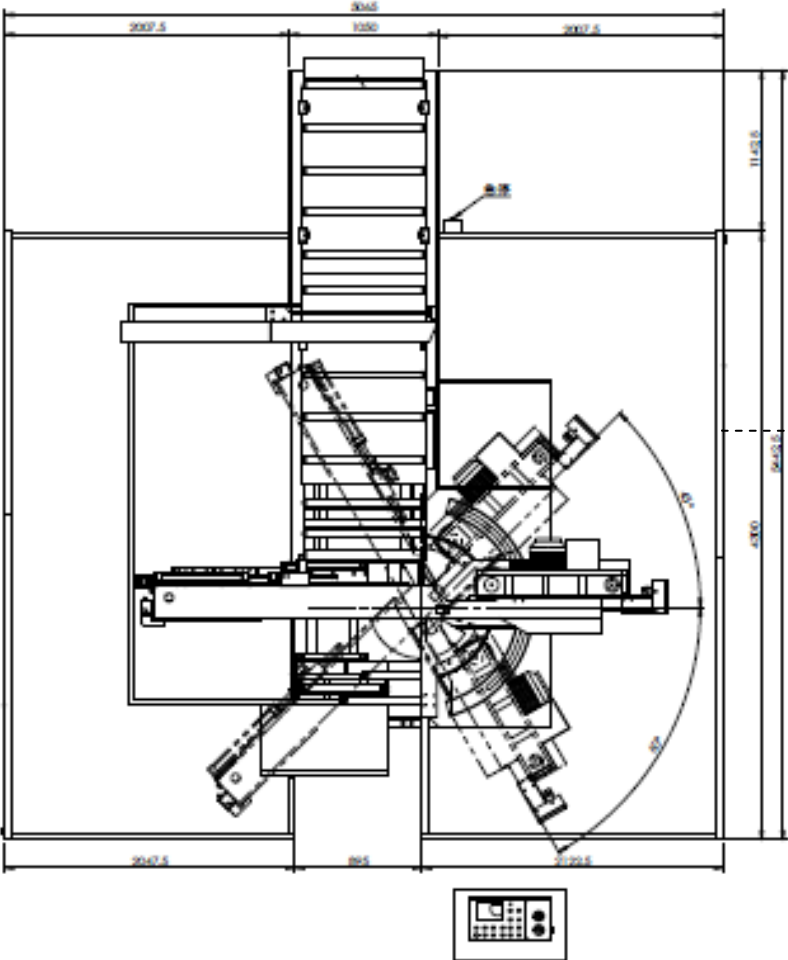
Take note of the following main moving parts on the machine prior to and during machine operation:

- Saw bow assembly
- Drive and idle wheels
- Blade guide arm
- Saw blade guide rollers
- Quick approach device
- Wire brush
- Chip conveyor (optional)
- Workpiece clamping vises
- Shuttle vises and workbed rollers
- Top clamps (optional)
- Gear reducer

**Illustration: Safety Fence**



**Safety Fences**



## **Safety Related Switches**

To protect the operator, the following safety related switches on the machine are actuated when the machine is in operation.

Wheel motion detector	This is a proximity sensor used to detect the motion of the drive wheel. Once the saw blade is broken <b>or as soon as it starts slipping</b> , the sensor will detect and stop the drive wheel and the machine.
Power switch	Located on the cover of electrical cabinet, the power switch controls the main power of the machine.
Emergency stop button	Located on <b>the control panel</b> , the button when pressed will stop the machine completely.
Vise clamp switch	This switch assures firm clamping of the workpiece. If the workpiece is not clamped properly, the saw blade is not allowed to run.
<b>Wheel cover interlock switches (CE model only)</b>	<b>Located on the two wheel housings, these switches are used to assure that the machine will stop whenever the wheel covers are open. This device is to protect users from being cut by the running saw blades.</b>

Among all these safety switches, some of them are used to protect the users and some of them are used to prevent damage to saw blades, the workpiece and the machine itself, etc. We have taken every precaution to prevent injury or damage and to provide safe and economical operation of the machine.

## **EMERGENCY STOP**

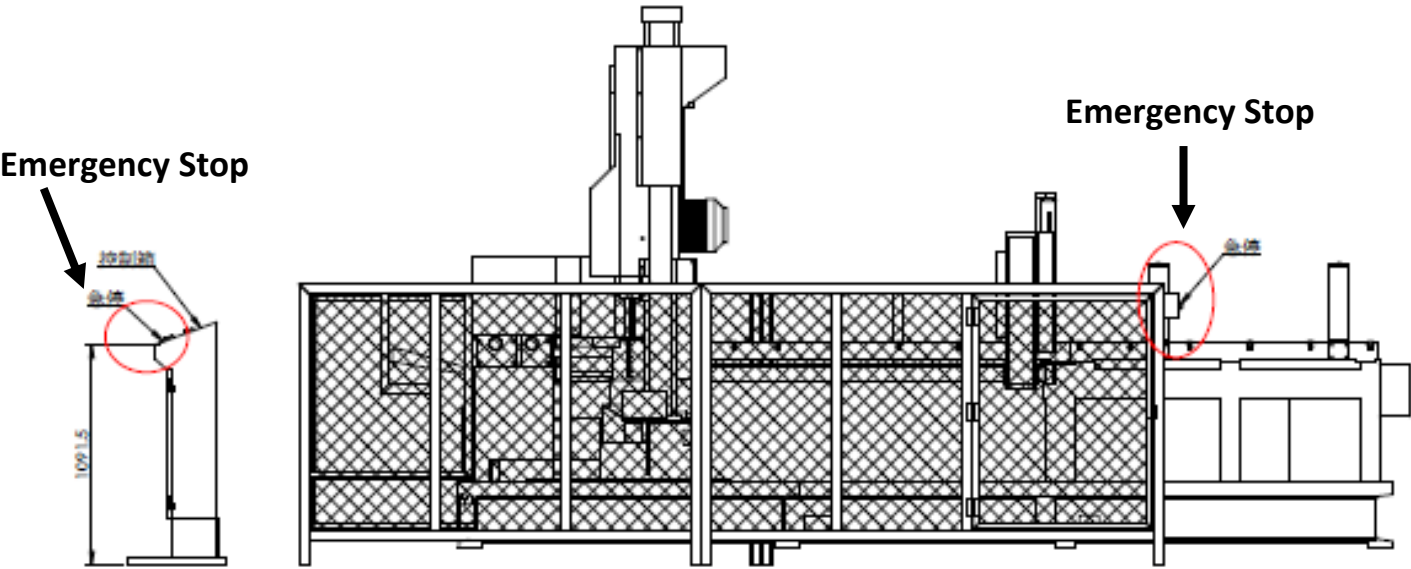
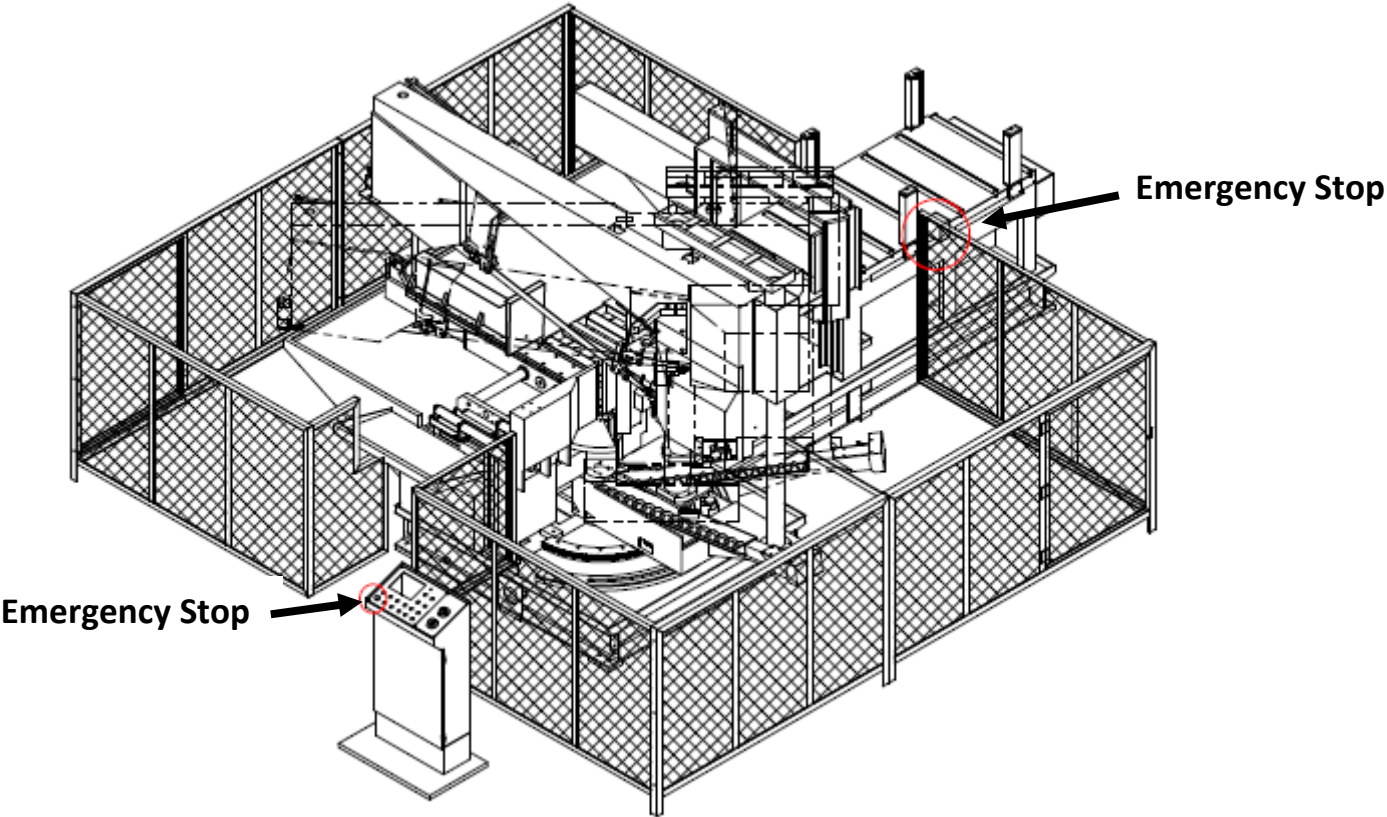
Designed to be easily accessible, the emergency stop button is located on the left bottom corner on the control panel and is made in red color and rubber material. **For CE models, supplementary emergency stop button may be available at other area(s) of the machine depending on machine type. Please refer to *Illustration: Emergency Stop*.**

When you press the button, the machine will immediately come to a full stop to avoid injury or damage when an accident occurs. The button will be locked when you press it. To unlock it, pull it upward.

You should press it immediately without any hesitation when observing:

- An emergency situation that would cause any injury or damage
- An abnormal situation or problem such as fire, smoke, abnormal noise and etc.

**Illustration: Emergency Stop**





# SAFETY LABELS

Safety-related labels mounted on the machine are categorized into the following four categories. Please read through and understand them before operating the machine. Refer to *Illustration: Safety Labels*.






## DANGER Labels

A red and white DANGER labels marks s hazards or unsafe practices that will result in severe personal injury or death.

Label	Meaning	Label	Meaning
	<p>Hazardous Voltage</p> <p>TURN POWER OFF before servicing. Failure to following the warning can result in severe injury.</p>		<p>DANGER: Running Blade</p> <p>Blade runs through this area. Keep your hands away from a running blade to avoid severe injury. The arrow indicates direction of the blade.</p>

## WARNING Labels



An orange and black WARNING label marks hazards or unsafe practices that can result in severe personal injury or damage to the machine.

Label	Meaning	Label	Meaning
	<p>Cutting Hazard</p> <p>KEEP COVER CLOSED while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.</p>		<p>Cutting Hazard</p> <p>KEEP HAND OFF while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.</p>
	<p>Please add antifreeze coolant when the ambient temperature is below 0°C (32°F).</p>		<p>Loose Hand Hazard</p> <p>KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury.</p>
	<p>Impact Hazard</p> <p>WEAR SAFETY SHOES. Do not approach dropping area during operation.</p>		




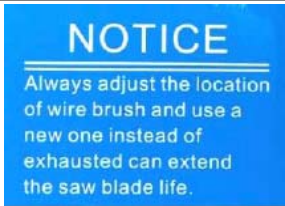
## CAUTION Labels

Yellow and black CAUTION labels mark hazards or unsafe practices that can result in considerable personal injury.

Label	Meaning
	Keep hands out of the machine while the blade is running.
	Power to machine must be turned off when changing blades or adjusting wire brush.

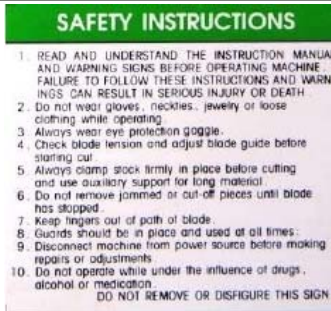
## NOTICE Labels

Blue and white NOTICE labels mean unsafe practices that could result in damage to products or property.

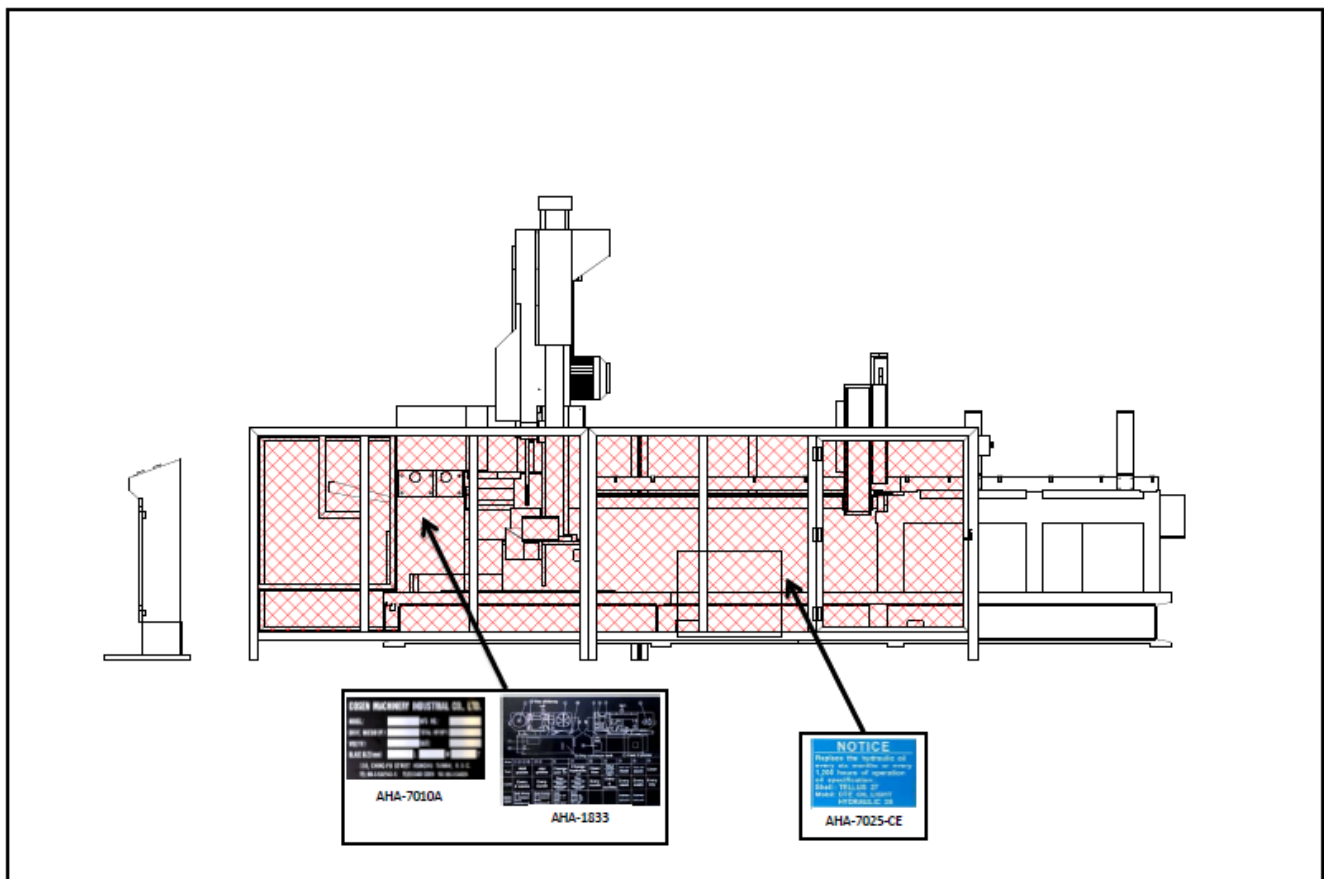
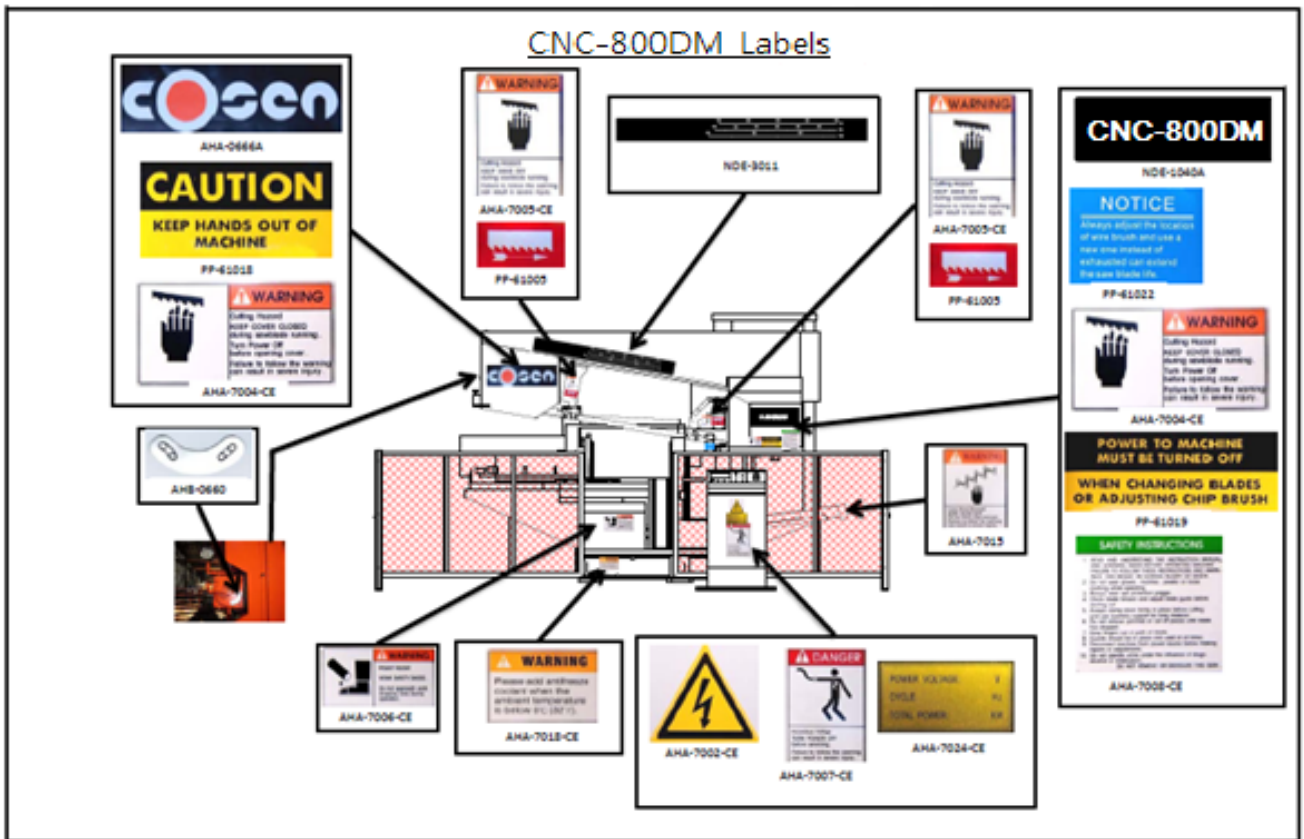
Label	Meaning
	Replace the hydraulic oil every six months or every 1,200 hours of operation.  Oil specification: Shell TELLUS 27 or Mobil DTE OIL LIGHT / HYDRAULIC 28
	To extend blade life, always adjust the location of wire brush so that it is properly touching the blade. Also replace a worn wire brush with a new one.

## **SAFETY INSTRUCTION Labels**

Green and white SAFETY INSTRUCTIONS are important reminders that should be read before operating the machine.

Label	Meaning
 <p><b>SAFETY INSTRUCTIONS</b></p> <ol style="list-style-type: none"><li>1. READ AND UNDERSTAND THE INSTRUCTION MANUAL AND WARNING SIGNS BEFORE OPERATING MACHINE. FAILURE TO FOLLOW THESE INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS INJURY OR DEATH.</li><li>2. Do not wear gloves, neckties, jewelry or loose clothing while operating.</li><li>3. Always wear eye protection goggle.</li><li>4. Check blade tension and adjust blade guide before starting cut.</li><li>5. Always clamp stock firmly in place before cutting and use auxiliary support for long material.</li><li>6. Do not remove jammed or cut-off pieces until blade has stopped.</li><li>7. Keep fingers out of path of blade.</li><li>8. Guards should be in place and used at all times.</li><li>9. Disconnect machine from power source before making repairs or adjustments.</li><li>10. Do not operate while under the influence of drugs, alcohol or medication.</li></ol> <p>DO NOT REMOVE OR DISFIGURE THIS SIGN</p>	<ol style="list-style-type: none"><li>1. Read and understand the instruction manual and warning signs before operating machine. Failure to follow these instructions and warnings can result in serious injury or death.</li><li>2. Do not wear gloves, neckties, jewelry or loose clothing while operating the machine.</li><li>3. Always wear eye protection goggles.</li><li>4. Check blade tension and adjust blade guide before starting to cut.</li><li>5. Always clamp stock firmly in place before cutting.</li><li>6. Do not remove jammed or cut-off pieces until blade has stopped.</li><li>7. Keep fingers out of path of blade.</li><li>8. Blade guards should be in place and used at all times.</li><li>9. Disconnect machine from power source before marking repairs or adjustments.</li><li>10. Do not operate while under the influence of drugs, alcohol or medication.</li></ol>

**Illustration: Safety Labels**



## HEARING PROTECTION

Noise has a major effect on the quality of your work environment. Here we refer you to testing data and information as follows:

Excessive exposure to high levels of noise may cause impairment to hearing, but the vulnerability to hearing loss varies between individuals and must be taken into account in specifying an allowable limit for noise exposure.

A level of 90 dBA is widely accepted as a criterion for 8 hour/day exposure to steady-state broadband noise. The unprotected ear should not be exposed to noise levels higher than 120 dBA.

Noise generated by the machine may come from the following:

- Saw blade during cutting or material feed mechanism
- Wire brush unit
- Chip conveyor unit
- Speed reducer
- Hydraulic motor/pump
- Belt transmissions variable speed motors
- Blade motor
- Coolant pump
- Drive wheel
- Parts not assembled tightly causing mechanical vibration

When your machine is running, noise will come out. This is a machine-electric interface problem that may make people feel uncomfortable. Our products pass noise testing less than 78 dBA. If your machine produces an undesirable noise while it is running, you should:

1. Make sure all maintenance tasks have been performed following the prescribed maintenance schedule (Refer to Section 7)
2. If maintenance does not seem to solve the problem, follow the troubleshooting procedures under Section 8.

## CE COMPLIANCE

Cosen's CE model is designed to satisfy regulations of the Council Directive on the approximation of the laws of the Member States relating to machinery (2006/42/EC) - Annex I Essential health and safety requirements relating to the design and construction of machinery.

## RISK ASSESSMENT

Risk assessment generally takes account of intended use and foreseeable misuse, including process control and maintenance requirements. We made every effort to avoid any personal injury or equipment damage during the machine design stage. However, the operator (or other people) still needs to take precautions when handling any part of the machine that is unfamiliar and anywhere on the machine that has potential hazards (e.g. the electrical control box).

# *GENERAL INFORMATION*

## **SPECIFICATION**

### **FLOOR PLAN**

This band saw machine is designed by Cosen's R&D engineers to provide you the following features and advantages:

#### Safety

- This machine is designed to fully protect the operator from its moving parts during cutting operation.
- The machine and each component has passed strict testing (Council Directive on the approximation of the laws of the Member States relating to Machinery).
- The machine will shut off automatically when the saw blade is broken, protecting both the operator and the machine.

#### Convenience & High-Performance

- The machine is designed in the way that the operation and adjustment can be easily performed.
- The machine will stop automatically when out of stock.
- Dual valve system is designed to achieve optimal cutting performance with the simple setting of feed rate and perspective cutting pressure for different material.

#### Durability

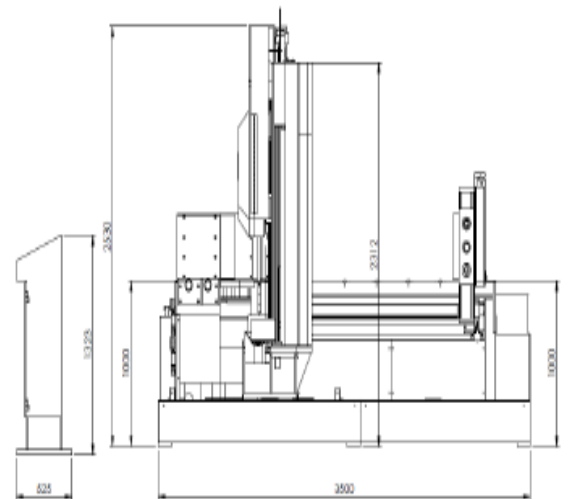
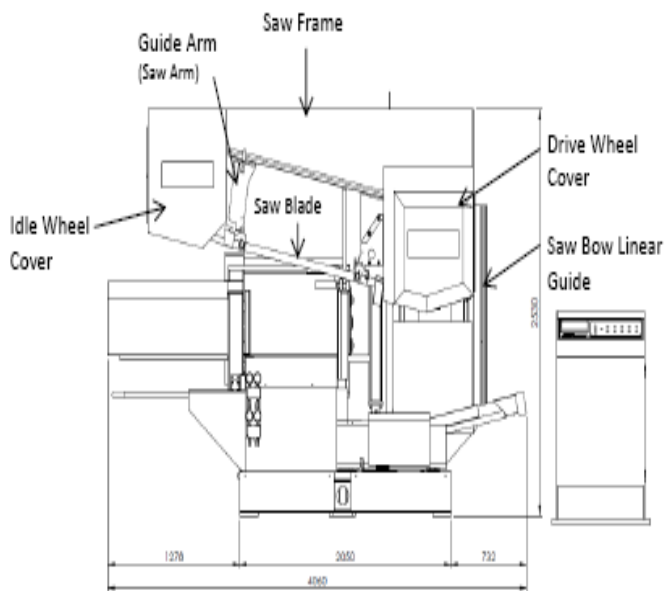
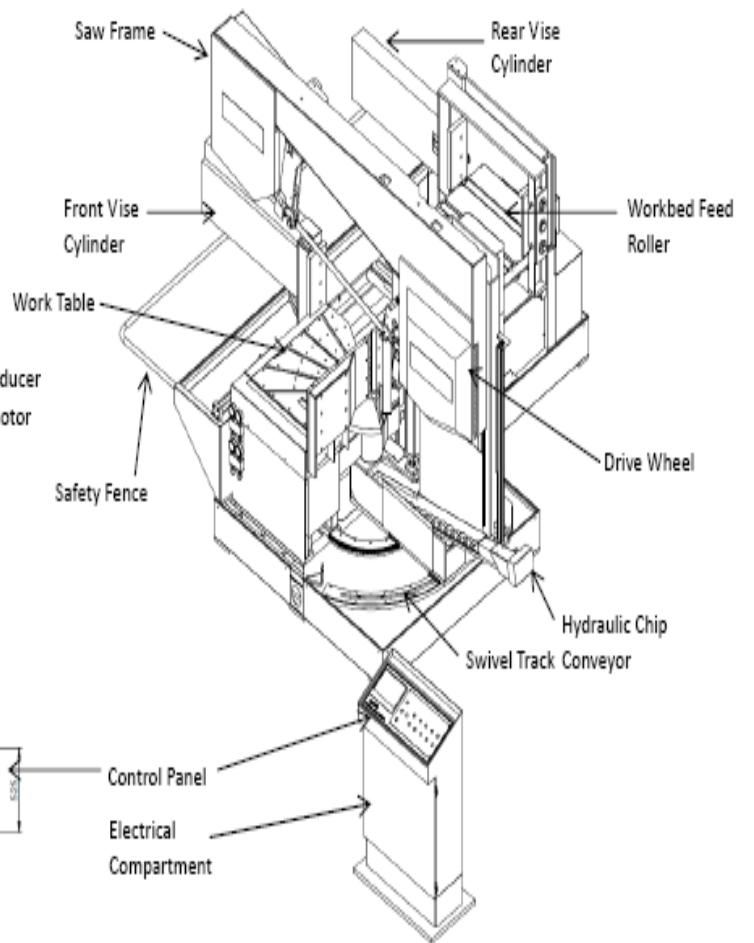
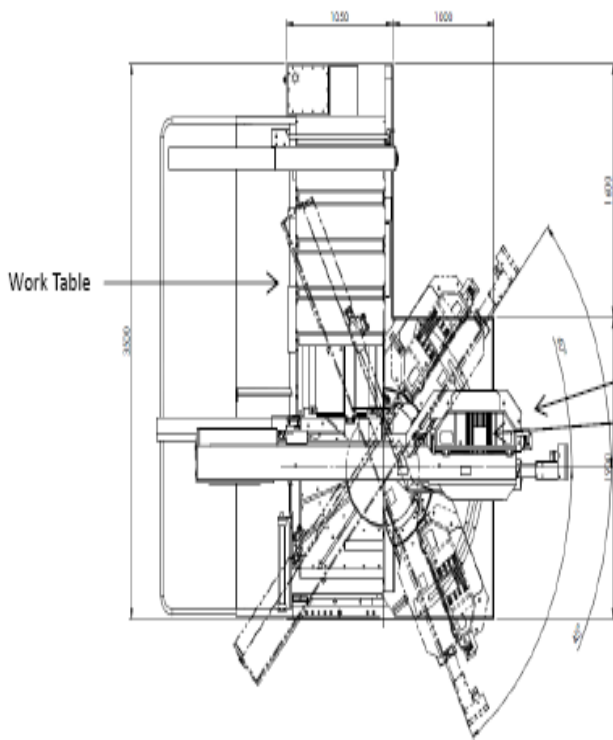
- The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

8 hours × 5 days × 52 weeks × 10 years = 20,800 hours

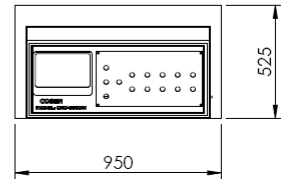
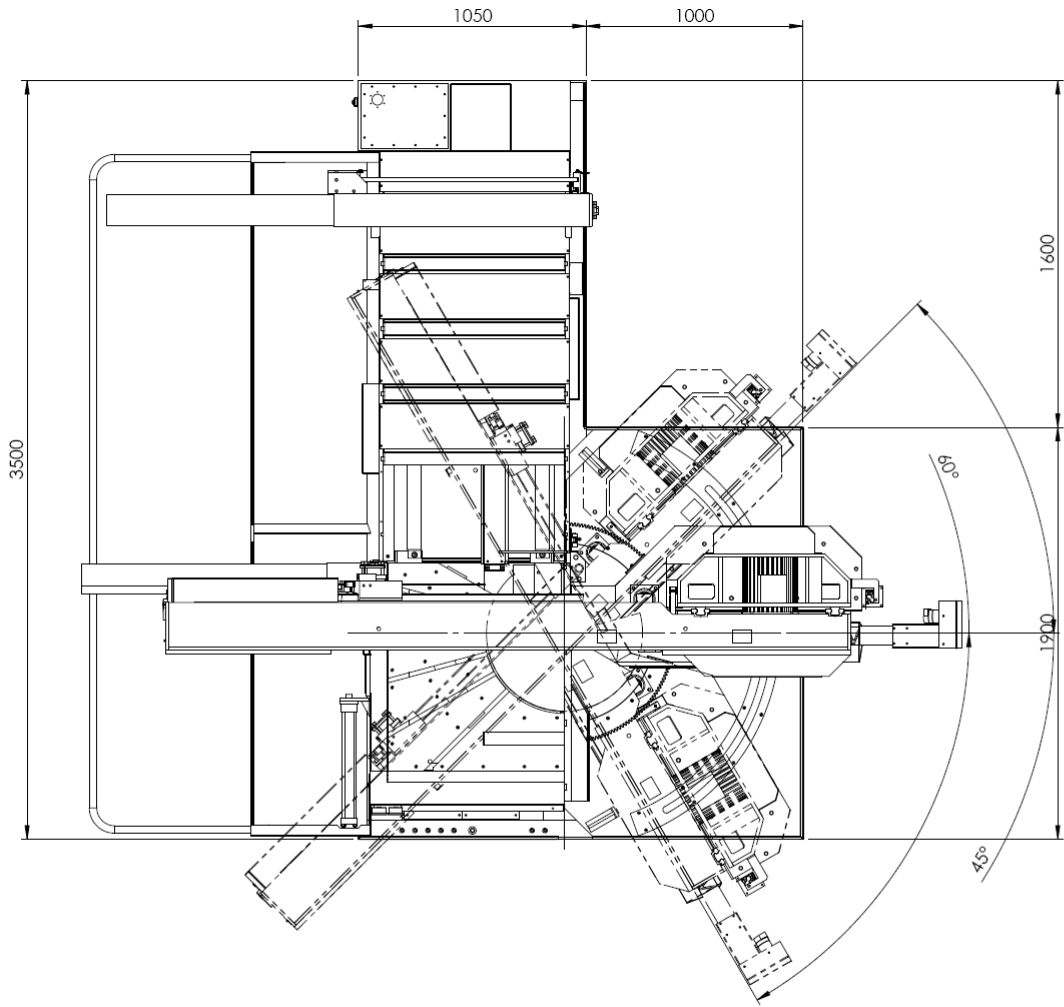
## SPECIFICATION

Model		CNC-800DM
Machine Type		CNC Programmable Automatic Double Miter-Cutting Band Saw
Miter Degree		+45° ~ -60°
Capacity	90° Round	550 mm (20 in.)
	90° Rectangular (H x W)	400 x 800 mm (16 x 31 in.)
	±45° Round	450 mm (17.7 in.)
	±45° Rectangular (H x W)	400 x 550 mm (16 x 21 in.)
	-60° Round	400 mm (16 in.)
	-60° Rectangular (H x W)	400 x 400 mm (16 x 16 in.)
Saw Blade	Speed	20 ~ 100 m/min (66 ~ 330 ft/min)
	Size (L x WxT)	6600 x 54 x 1.3 mm (260" x 2.1 "x 0.050")
	Tension	Hydraulic
	Guide	Interchangeable tungsten carbide
	Cleaning	Steel wire brush with flexible drive shaft driven by hydraulic system
Motor Output	Saw Blade	7.5 HP (5.6 kW)
	Hydraulic	3 HP (2.25 kW)
	Coolant Pump	1/2 HP (0.375 kW)
Hydraulic System	Tank Capacity	95 L (25.1 gal)
	Output Pressure	45 ~ 50 kg/cm <sup>2</sup>
Coolant Tank Capacity		200 L (52 gal)
Feeding Length	Mode	Hydraulic, NC Automatic
	Single Stroke	1500 mm (59 in.)
	Multi Stroke	Max. 6500 mm (650 in.)
	Rest Piece	380 mm (14.9 in.)
Workbed Height		1050 mm (42.7 in.)
Weight	Gross	7000 kg
	Floor Space (W X D X H)	

# MACHINE PARTS IDENTIFICATION

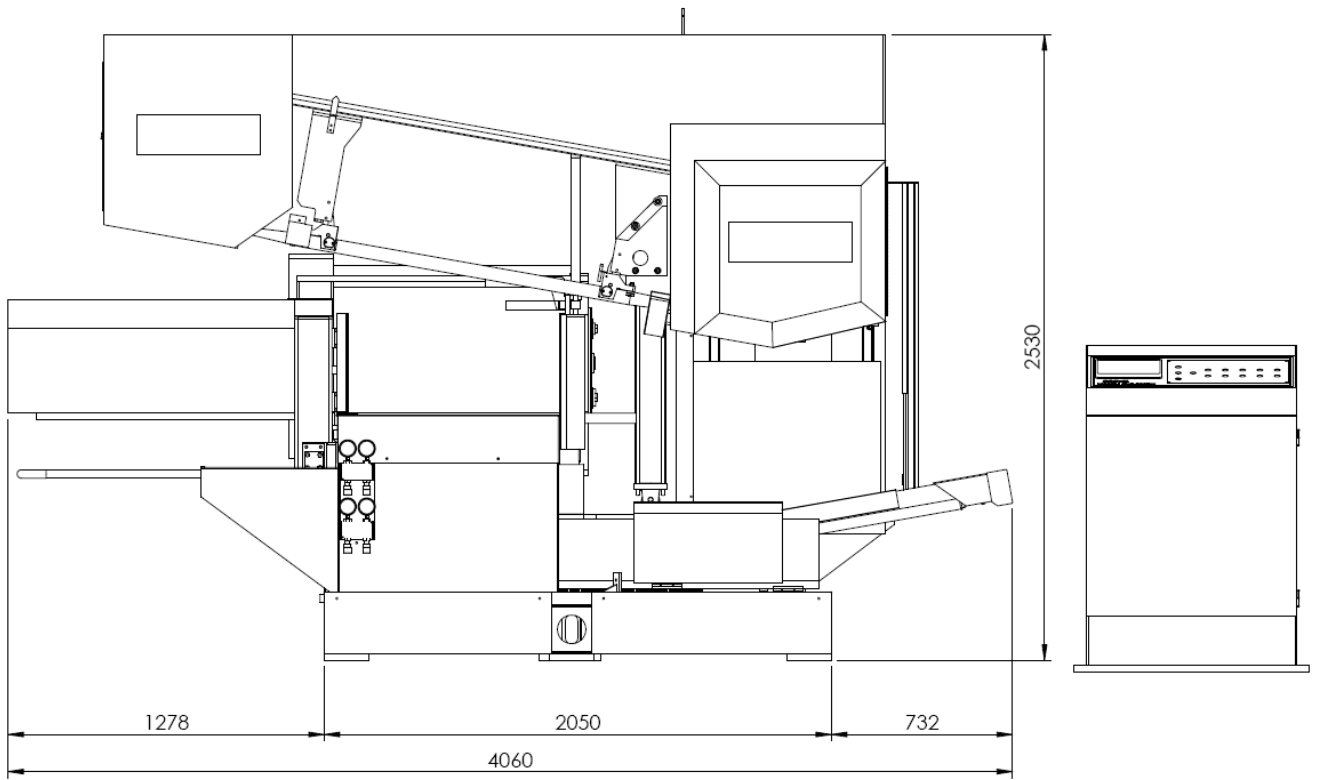


# FLOOR PLAN

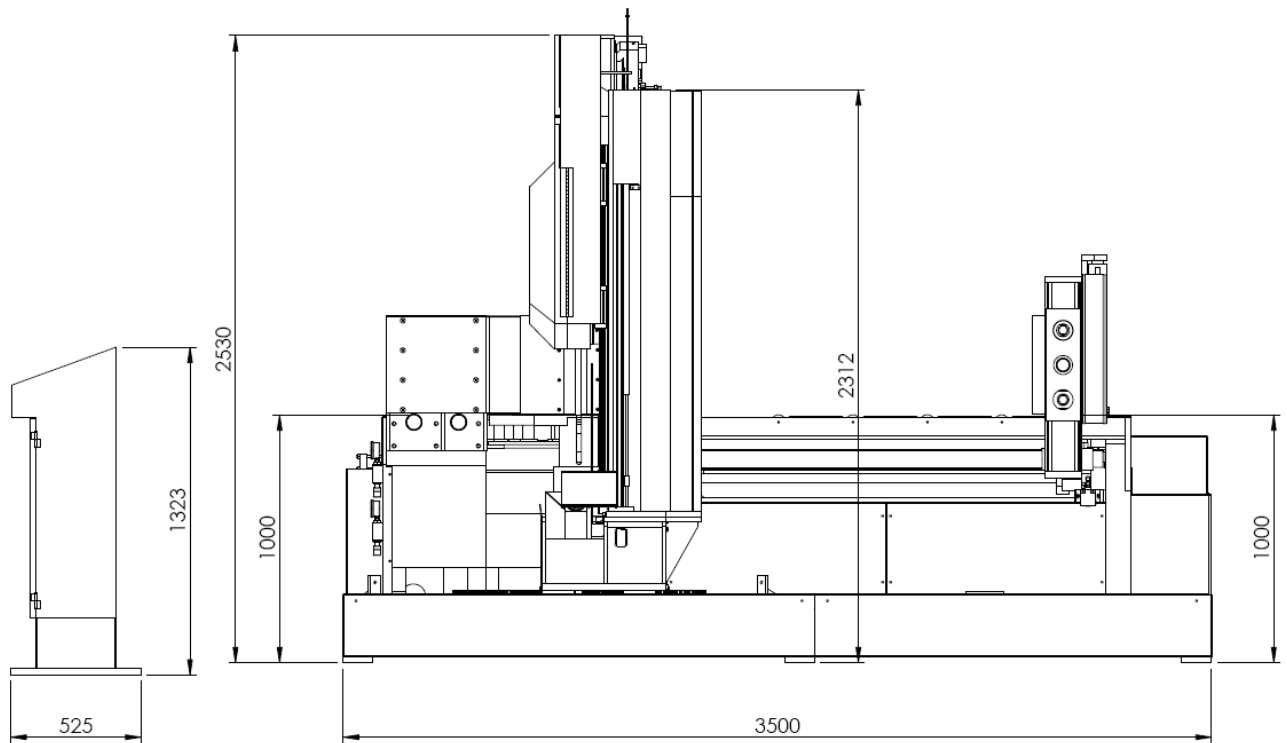


Machine top view





**Machine front view**



**Machine side view**

# INSTALLATION

LOCATION & ENVIRONMENT

UNPACKING & INSPECTING

LIFTING

REMOVING SHIPPING BRACKET

CLEANING

INSTALLING

RELOCATING

## LOCATION & ENVIRONMENT

For your safety, please read all information regarding installation before proceeding. Install your machine in a place satisfying all of the following conditions:

### Space:

- Leave enough free space around the machine for loading work and unloading cut-off pieces as well as for maintenance and inspection. Refer to *Section 1 Description* for machine dimensions and floor space.

### Environment:

- Well lighted (500 lumen at minimum).
- Floor kept dry at all times in order to prevent operators from slipping.
- Away from direct exposure to the sunlight
- Room temperature between 5°C to 40°C.
- Humidity level kept at 30%~95%“(without condensation) to avoid dew on electric installation and machine.
- Away from vibration of other machines
- Away from powders or dusts emitted from other machines
- Avoid uneven ground. Choose a solid level concrete floor which can sustain weight of approximately 15 tons (including both machine and material weight).
- Limit the operation area of the machine to staff only.

## UNPACKING & INSPECTING

- Unpack your machine carefully to avoid damage to machine parts or surfaces.
- Upon arrival of your new band saw, please confirm that your machine is the correct model and it comes in the same specification you ordered by checking the model plate on the machine base.
- It is also imperative that a thorough inspection be undertaken to check for any damage that could have occurred during shipping. Pay special attention to machine surface, equipments furnished and the electrical and hydraulic systems for damaged cords, hoses and fluid leaks.
- In the event of damage caused during shipping, please contact your dealer and consult about filing a damage claim with the carrier.
- Your machine comes in with a set of tools for you to maintain the machine. The accessories furnished are as follows:
  1. Tool box 1 pc
  2. Grease gun 1 pc
  3. Screwdriver (+, -) 2 pcs
  4. Open-ended spanner 3 pcs
  5. Hexagon wrench 1 set
  6. Chip spade (only for manual models) 1 pc
  7. Operation manual 1 pc



Should you find any missing accessories, please contact your local agent immediately.

## LIFTING

When moving the machine, we strongly suggest you choose any one of the methods described below to move your machine.

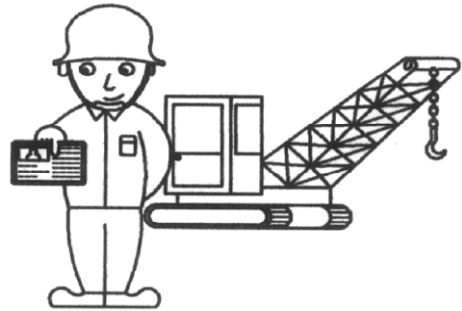
### 1. Use a crane

Move the machine to its location by using a crane and a wire rope sling that can fully withstand the weight of the machine (refer to machine specification under Section 1 *Description*).

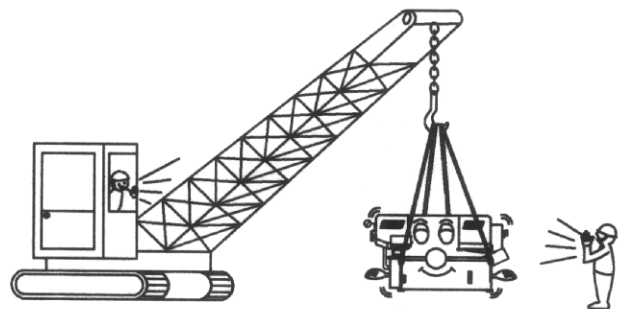
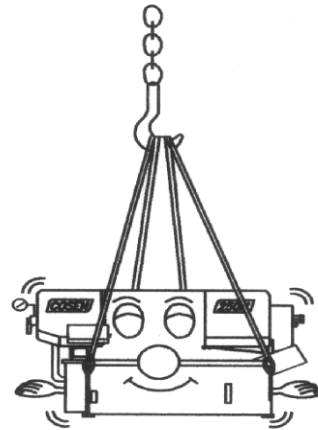
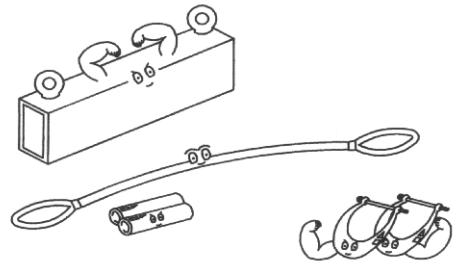
- Machine lifting is likely to damage the machine if not performed properly.



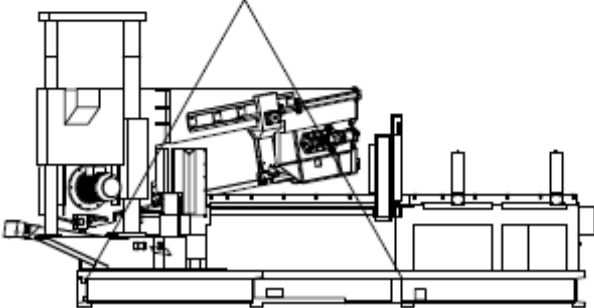
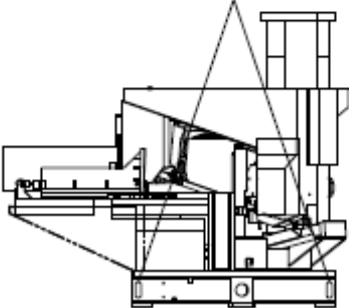
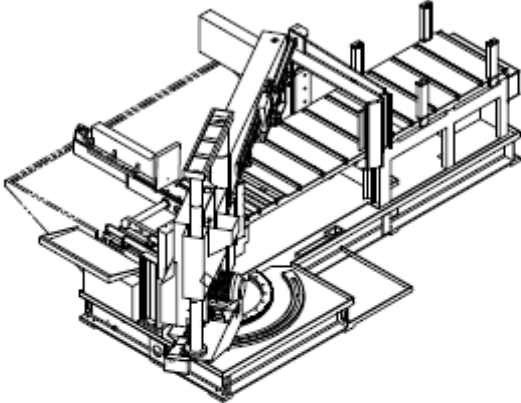
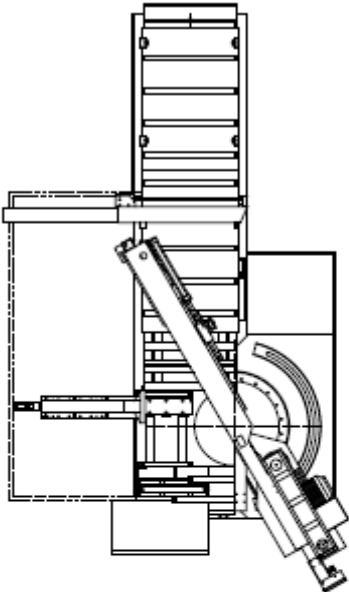
**Warning:** You must have a qualified crane operator to perform the job.



- You must use tools and equipment with the proper tensile strength and use proper method when moving your machine.
- Apply the wire rope sling to the lifting hooks on the four ends of the machine. Refer to *Illustration: Lifting Points for exact locations*.
- Slowly lift the machine. Be sure to protect the machine from impact or shock during this procedure. Also watch out your own fingers and feet to avoid injuries.
- Keep the machine well balanced during lifting process and make sure the wire rope does not interfere with the saw frame.
- When you work together with more than two people, it is best to keep constant verbal communication with each other.



**Illustration: Lifiting Points**



Minimum weight capacity for each wire rope: **5.4 ton**  
Total number of wire ropes required: **4**

## 2. Use a forklift

Most users choose this method to move their machine because it is easy to set up. Make sure that the lifting rod can fully withstand the weight of the machine. (Refer to *Section 2 – General Information for Specifications*)

- Machine lifting is likely to damage the machine if not performed properly.



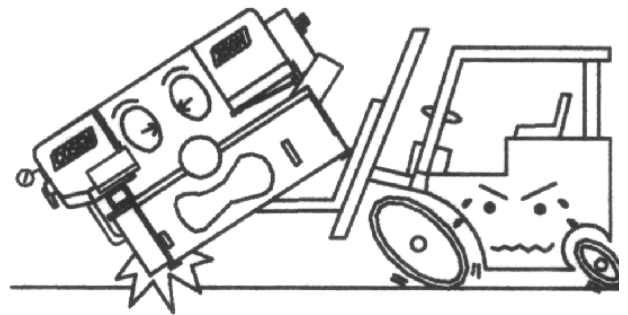
You must have a qualified forklift operator to perform the job.



- You must apply proper forklift technique to avoid damage to the machine.



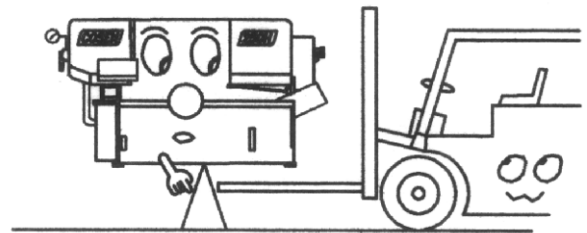
Make sure the forks are able to reach in at least 2/3 of the machine depth.



- You must keep the machine balanced at all times.



Make sure the forks are centered before use.

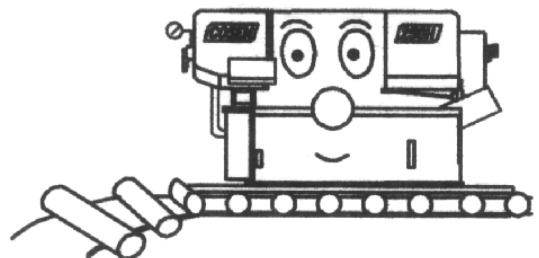


(Illustration only. Please follow user guide of your forklift.)

## 3. Use rolling cylinders

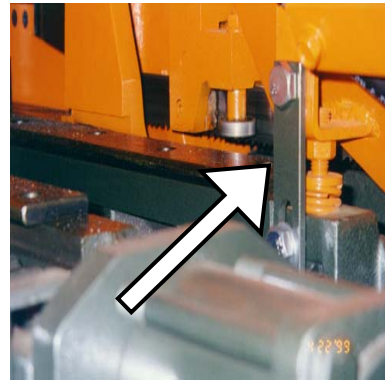
You can use rolling cylinders to move your machine in a small machine shop environment.

- You must use rolling cylinders made in material of proper compressive strength.



## REMOVING SHIPPING BRACKET

- After the machine has been properly positioned, remove the shipping bracket that is used to lock the saw frame and the saw bed.
- Retain this bracket so that it can be used again in the event that your machine must be relocated.



## CLEANING

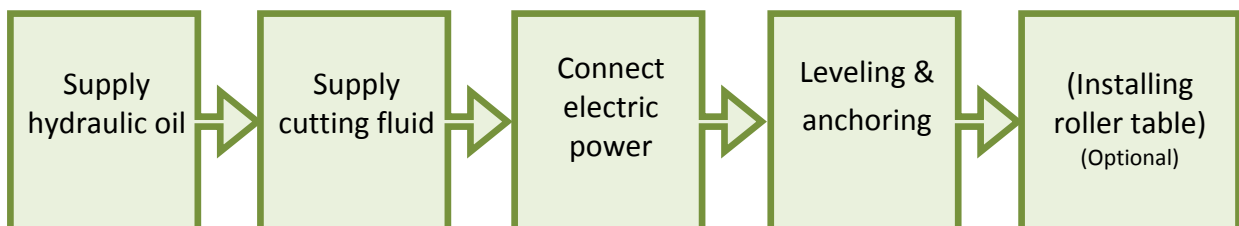
After the machine has been placed at the designated position, remove the rust-preventive grease with wiping cloth dampened with cleaning oil or kerosene. Apply machine oil to machine surfaces that are prone to rust.



Do not remove the rust-preventive grease with a metal scraper and do not wipe the painted surfaces with solvent as doing so would damage surface paint.

## INSTALLING

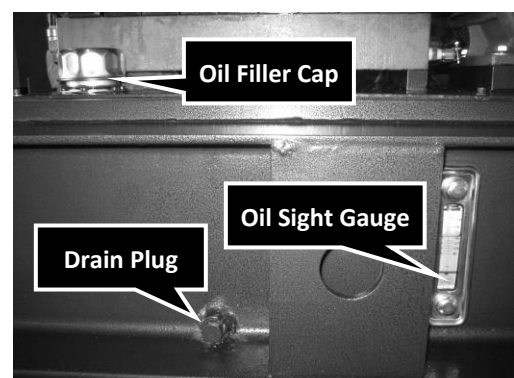
Cosen's bandsaw machine is relatively easy to install. Follow these six easy steps to install your machine.



### Supplying hydraulic oil

Open the filler cap and fill the hydraulic oil tank to above 2/3 or full level.

Check the sight gauge to make sure the oil level in the tank.





Refer to specification chart under Section 1 for tank capacity.

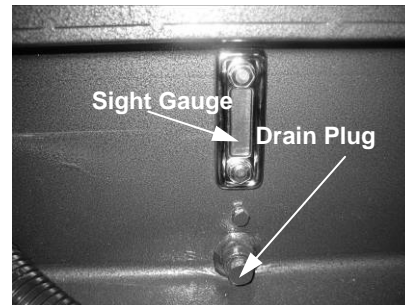


Oil tank should be full already if it is a new machine that operates for the first time.

### **Supplying coolant**

Fill the coolant tank to the middle level of the sight gauge by pouring the coolant from above the chip conveyor.

Use the sight gauge to check the coolant level remaining in the tank.



Always check the coolant supply before starting the machine. If the coolant pump is started without enough coolant supply in the tank, the pump and its drive motor may be damaged.



Refer to specification chart under Section 1 *Description* for tank capacity.




Consult your coolant supplier for bandsaw use regarding coolant type and mix ratio.

### **Connecting electric power**



Have a qualified electrician make the electrical connections.



If the power supply voltage is different from the transformer and motor connection voltage shown on the label attached to the electrical compartment of the machine, contact COSEN or your agent immediately. 



Connect to power supply independently and directly. Avoid using the same power supply with electric spark machines such as electric welder. Unstable electric tension may affect your machine's electric installation from working properly.



Ground the machine with an independent grounding conductor.



Supply voltage: 90% - 110 % of nominal supply voltage.



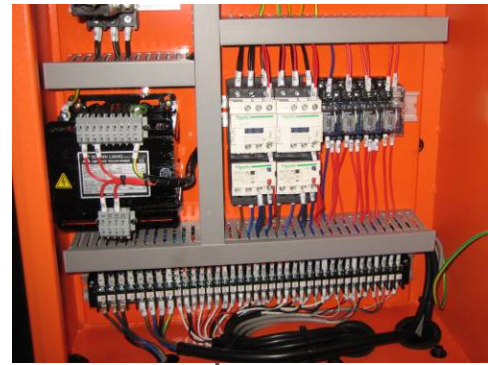
Source frequency: 99% - 101 % of nominal frequency.



Refer to the specification chart under Section 1 for total electric power consumption of the motors and make sure your shop circuit breaker is capable of this consumption amount. Also use a power supply cable of proper size to suit the power supply voltage.



1. Turn off the shop circuit breaker.
2. Make sure the machine circuit breaker switch on the electrical compartment door is turned to OFF.
3. Remove the screw securing the electrical compartment and then open the door.
4. Pull the power supply cable and grounding conductor through the power supply inlet into the electrical compartment. (Shown right)
5. Connect the power supply cable to the circuit breaker (N.F.B.) to the R, S and T terminals, and connect the ground cable to the E terminal.
6. Close the compartment door and fasten the screw back.
7. Turn on the shop circuit breaker and then turn the machine circuit breaker switch to ON. The *Power Indicator* on the control panel will come on.
8. Pull to unlock the *Emergency Stop* button and press the *hydraulic ON* button to start the hydraulic motor.
9. Make sure the sawing area is clear of any objects. Start the blade and check the blade rotation. If the electrical connections are made correctly, the blade should run in a counterclockwise direction. If not, shut the hydraulics off, turn off the machine as well as the shop circuit breaker. Then swap the power the power cable conductors connected to R and T terminals.
10. Repeat step 6 to 9 to ensure the electrical connections are in the right order.

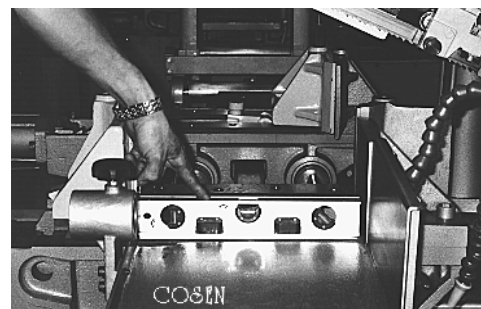


Power Supply Inlet

### Leveling

Place spirit level on the vise slide plates and the work feed table.

Level the machine in both directions i.e. along and across the machine. Adjust the level of the machine by turning the leveling bolts.



Make sure all leveling bolts evenly support the machine weight.



In some cases, leveling the machine with a slight slope toward the front of the machine is recommended as it would prevent coolant from running down cutting material especially tubes or bundles. To do so, make the rear end of the machine approximately 10 mm higher than the level of the front end.

## **Anchoring the machine**

Normally there is no need to anchor the machine. If the machine is likely to vibrate, fix the machine to the floor with anchor bolts.

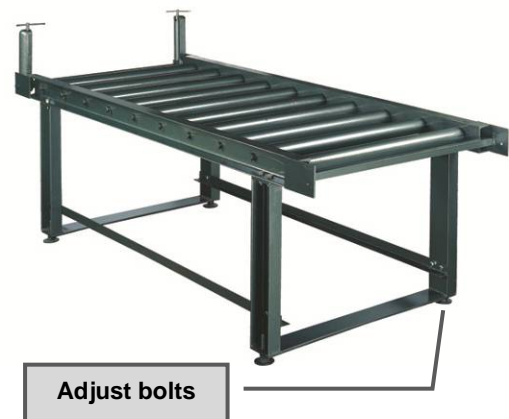
Shock absorption steel plates are provided and can be placed under each leveling bolt to prevent their sinking into the concrete floor.

## **Installing roller table (optional)**

The roller table is used to support long material at the rear and/or the front of the machine.

If you have ordered the optional roller table for cutting long material, position it before or behind the machine.

Level the roller table and the stand with the machine by adjusting the leveling bolts.



## **Installing Fire Control Device**

Install a fire extinguisher or any other fire control device in the shop in case a fire breaks out.

## **RELOCATING**

We recommend you follow these procedures when relocating or shipping your machine to other place:

1. Descend the saw frame to its lowest position then turn off the power.
2. Fix the saw frame using the shipping bracket that originally came with the machine.
3. If you are shipping the machine, pack the machine carefully with industrial plastic wraps to protect it from dust.
4. Use a crane or forklift to raise it. If a crane is used to lift the machine, ensure that the lifting cable is properly attached to the machine.
5. Do not forget to include the equipments originally furnished including the shock absorption steel plates and the instruction manual.

# *OPERATING INSTRUCTION*

**SAFETY PRECAUTIONS  
BEFORE OPERATING  
CONTROL PANEL  
REPLACING PLC BATTERY  
STANDARD ACCESSORIES  
OPTIONAL ACCESSORIES  
MANUAL CUTTING  
AUTOMATIC CUTTING  
UNROLLING & INSTALLING THE BLADE  
ADJUSTING WIRE BRUSH  
ADJUSTING BLADE SPEED  
ADJUSTING COOLANT FLOW  
BREAKING-IN THE BLADE  
TEST-RUNNING THE MACHINE  
TERMINATING A CUTTING OPERATION**

## **SAFETY PRECAUTIONS**

For your safety, please read and understand the instruction manual before you operate the machine.

The operator should always follow these safety guidelines:

- The machine should only be used for its designated purpose.
- Do not wear gloves, neckties, jewelry or loose clothing/hair while operating the machine.
- For eye protection, always wear protective safety glasses.
- Check the blade tension and adjust blade guides before starting the machine.
- Use auxiliary clamping or supporting devices to fix material in place before cutting long workpieces. Always make sure the material is clamped firmly in place before starting to cut.
- Do not remove jammed or cut-off pieces until the blade has come to a full stop.
- Keep fingers away from the path of the blade.
- Protection devices should be in place at all times. For your own safety, never remove these devices.
- Disconnect machine from the power source before making repairs or adjustments.
- Wear protection gloves only when changing the blade.
- Do not operate the machine while under the influence of drugs, alcohol or medication.
- Do not take your eyes off the machine while in operation.
- Do place warning signs to mark out machine work zone and restrict entry to be staff-only.

## BEFORE OPERATING

Choosing an appropriate saw blade and using the right cutting method is essential to your cutting efficiency and safety. Select a suitable saw blade and cutting method based on your work material and job requirements e.g. cutting accuracy, cutting speed, economic concern, and safety control.

### Wet cutting

If you choose dry cutting or low-speed cutting, the chips may accumulate in machine parts and may cause operation failure or insulation malfunction. We suggest you choose wet cutting to avoid machine damage.

### Cutting unknown materials

Before cutting an unknown material, consult the material supplier, burn a small amount of chips from the material in a safe place, or follow any other procedure to check if the material is flammable.



Never take your eyes off the machine while in operation.

### Cutting fluid

For cooling and lubrication purpose, we recommend you use water-soluble cutting fluids. The following table lists out its pros and cons for your reference.

Pro	Con
<ul style="list-style-type: none"><li>• Have a high cooling effect</li><li>• Not flammable</li><li>• Economical</li><li>• Does not require cleaning of the cut products</li></ul>	<ul style="list-style-type: none"><li>• Remove machine paint</li><li>• Lose its rust protection effect if deteriorated</li><li>• Tend to create foam</li><li>• Subject to decay</li><li>• Decline in performance, depending on the quality of the water used for dilution</li></ul>



Never use water as your coolant.



Always add coolant into water for better mix result.



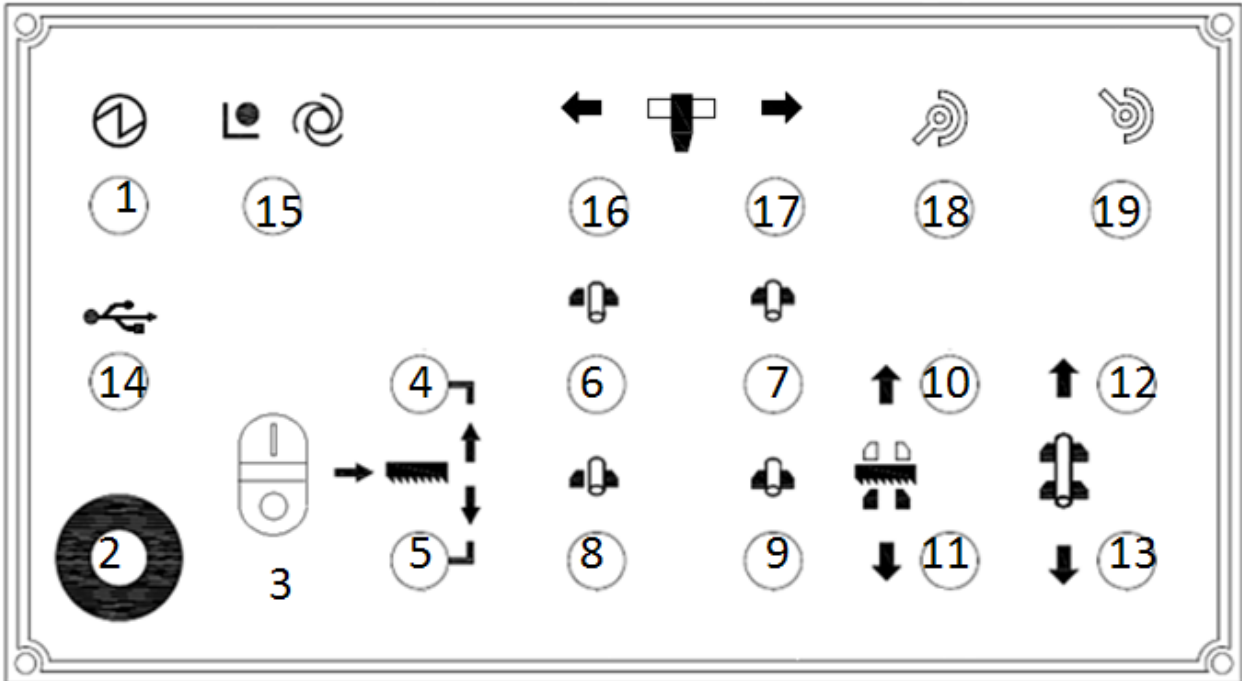
Consult your coolant supplier for bandsaw use regarding coolant type and mix ratio.



Before starting a cutting job, make sure there is sufficient amount of coolant in the tank. Check the fluid level through the sight gauge. Please refer to machine specifications in this manual (Section 2) for tank capacity.

## CONTROL PANEL

The control panel is located on the top of the electrical box. It includes the following function: power system, hydraulic system, cooling system and the human-machine-interface (HMI). The operator must fully understand the function of each switch and button before operating the machine.



No.	Name	No.	Name
1	Power indicator lamp	11	Front movable vise forward button
2	Emergency stop button	12	Shuttle bed – feed backward button
3	Saw blade start/stop buttons (with built-in lamp)	13	Shuttle bed – feed forward button
4	Saw bow up (cutting stop) button	14	USB port (for flash disk/memory stick)
5	Saw bow down button	15	Setting/cutting mode key switch
6	Rear vise open button	16	Guide arm to the LEFT
7	Rear vise clamp button	17	Guide arm to the RIGHT
8	Front vise open button	18	Saw head swivel forward (counterclockwise)
9	Front vise clamp button	19	Saw head swivel backward (clockwise)
10	Front movable vise backward button		

## Control Buttons

### 1. Power indicator lamp


When the lamp is on, it indicates the power to the machine is turned on.

### 2. Emergency stop button

Press this button to stop the machine in an emergency. When the button is pressed, it brings the machine to a full stop. The button locks when pressed. In order to unlock it, please turn the button clockwise.

### 3. Saw blade start/stop buttons (with built-in lamp)

The green button is saw blade start button and the red button is saw blade stop button. When the green button is pressed, the built-in lamp comes on and saw blade starts to cut. Press red button to

stop cutting. The blade will start only when under cutting mode .



After the saw blade starts, the blade will come down at first quick then the preset downfeed speed:

Quick approach speed	Used in order to save operation time. The machine will calculate the quick approach height by the preset material shape( rectangle or round) in HMI, then the saw bow descends at a quicker speed reaching the quick approach height. See more info in Material shape in HMI section.
Downfeed speed	When the blade leaves the quick approach height, the saw bow will slow to come down at the downfeed speed as preset in HMI.



Before pressing *saw blade start* button, please make sure the material shape is chosen correctly. Failure to do so might cause material not cut through and blade or material damage.




After the blade motor starts running, the forward/backward functions of front and rear vises are disabled due to safety concerns.



During operation, do not approach front bed where dropping might occur .


### 4. Saw bow up (cutting stop) button

This button only works when the machine is switched to setting mode  . When this button is pressed, the saw bow rises until the operator lets go of the button or until the saw bow touches the upper limit switch.



While pressing the saw bow up button can stop the running blade, please still use the emergency stop button in an emergency.

## 5. Saw bow down button

This button only works when the machine is switched to setting mode . When this button is pressed, the saw bow descends.




This machine incorporates a *blade descend clearance check* feature to control and ensure the blade can be lowered only when it is safe to do so. For more information, refer to *HMI control panel* in later section.




The blade comes down at first quick then the preset downfeed speed. Please refer to supplementary notes previously explained in No. 3 saw blade start button.

## 6. Rear vise open button

This button only works when the machine is switched to setting mode . When this button is pressed, the rear vises will open until the operator lets go of the button or until the vises are fully opened.


## 7. Rear vise clamp button

This button only works when the machine is switched to setting mode . When this button is pressed, the rear vises will close until the operator lets go of the button or until the vises are fully closed.



Rear vise cannot clamp the inclined plane of the material, or it might damage the machine. Therefore material end cannot be an inclined plane.

## 8. Front vise open button


This button only works when the machine is switched to setting mode . When this button is pressed, the front vises will open until the operator lets go of the button or until the vises are fully opened.



If the saw bow is not at the upper limit switch position, the front vise can only be opened in small increments, so as to prevent the vise from hitting the guide arm.

## 9. Front vise clamp button




This button only works when the machine is switched to setting mode . When this button is pressed, the front vises will close until the operator lets go of the button or until the vises are fully closed.



Front vise cannot clamp the inclined plane of the material, or it might damage the machine. Therefore material end cannot be an inclined plane.


#### **10. Front movable vise backward button**

This button only works when the machine is switched to setting mode . Front vise moves backward when this button is pressed.



This button is enabled only when the saw bow is at its top most position.


#### **11. Front movable vise forward button**

This button only works when the machine is switched to setting mode . Front vise moves forward when this button is pressed.



This button is enabled only when the saw bow is at its top most position.

#### **12. Shuttle bed – feed backward button**

This button only works when the machine is switched to setting mode . When this button is pressed, the shuttle bed (shuttle vise) will move backward. Press and hold the button to feed backward. As soon as the button is released, the shuttle bed will stop moving backward.




This button is only in function when the saw bow is at its top most position AND when the front and rear vises are NOT clamped simultaneously.



Before moving the shuttle vise backward, open the shuttle vise wider than the material to avoid collision.

#### **13. Shuttle bed – feed forward button**

This button only works when the machine is switched to setting mode . When this button is pressed, the shuttle bed (shuttle vise) will move forward. Press and hold the button to feed forward. As soon as the button is released, the shuttle bed will stop moving forward.



This button is only in function when the saw bow is at its top most position AND when the front and rear vises are NOT clamped simultaneously.




Before moving the shuttle vise forward, open the shuttle vise wider than the material to avoid collision. When moving forward the shuttle vise clamped with the material, pay attention not to hit the front vise.


#### 14. USB port (for flash disk/memory stick)

#### 15. Setting/cutting mode key switch

This selector switch provides two modes to choose from: setting and cutting. To switch between these modes, a key is required. Please keep the key at a safe place and do not lose it.

	<b>Setting mode</b>	Used when operating the machine manually. When switching to setting mode, any automatic function will stop and HMI auto/single loop mode will automatically select single loop mode 
	<b>Cutting mode</b>	Used when operating automatic function, i.e. Home and Auto Swivel, and cutting.


#### 16. Guide arm to the LEFT

This button only works when the machine is switched to setting mode . Press this button to move the guide arm to the left.



For the guide arm to be able to move, the saw head must be at the upper limit and the carbide inserts must be unclamped.

#### 17. Guide arm to the RIGHT

This button only works when the machine is switched to setting mode . Press this button to move the guide arm to the right.




For the guide arm to be able to move, the saw head must be at the upper limit and the carbide inserts must be unclamped.

#### 18. Saw head swivel forward (counterclockwise)

When this button is pressed, the saw head will start swiveling forward i.e. counterclockwise until the button is released or until reaching the maximum “+” mitering capacity, 45°. Press the button and release it when arriving at your desired mitering angle (shown on the HMI touch screen).



This button only works when the following conditions are both met:


- When the machine is switched to setting mode .
- When the saw frame is raised to its upper most position i.e. when the saw bow upper limit switch is activated.

### 19. Saw head swivel backward (clockwise)

When this button is pressed, the saw head will start swiveling backward i.e. clockwise until the button is released or until reaching the maximum “-” mitering capacity, 60°. Press the button and release it when arriving at your desired mitering angle (shown on the HMI touch screen).



This button only works when the following conditions are both met:

- When the machine is switched to setting mode .
- When the saw frame is raised to its upper most position i.e. when the saw bow upper limit switch is activated.

## Human-machine-interface (HMI) touch screen

This HMI touch screen displays operation messages so that the operator is able to understand the system condition. It also provides different operating modes and selections for the operator to work with. During a cutting job, the operator can still enter the system and make changes to the cutting operation as needed.



Do not wipe or clean the screen with volatile solvents.



Do not overexert pressure on the screen. The touch screen is very sensitive; all buttons on the screen just need a slight touch to operate.



All range parameters in Advantech 10” are configured under the “manual” mode.



Please pay attention to the following environment conditions necessary for Advantech 10” HMI touch screen to properly operate:

Item	Range
Ambient temperature	5°C ~ 50°C
Temperature for safe operation	-10°C ~ 60°C
Ambient humidity	30%~85% RH (No condensation)
Connection	RS422 MMI port
Environment	No condensation and rust



## Startup Screen

After the power is turned on, Cosen's logo will appear as the startup screen, followed by the main operation menu..











## Main control menu

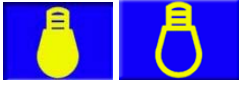






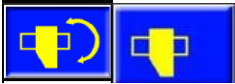
The main control menu includes some operating button that were used on the control panel of the earlier machines. Some convenient functions are added to the page for the operator to better understand the features of the machine. Setting the parameters shown on the screen requires a gentle touch of the finger. You can also look up the parameters or make changes while in the middle of a cut.


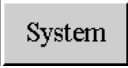


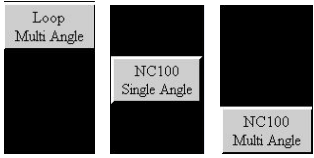
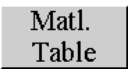
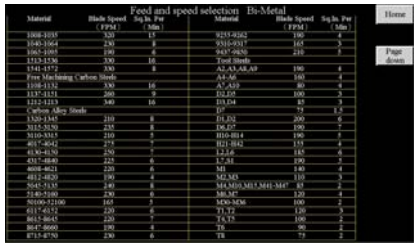

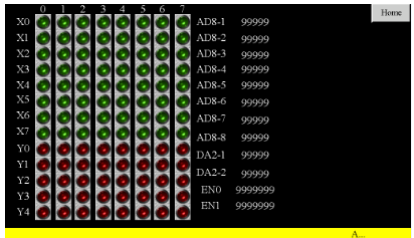
The screenshot displays the main control menu interface with various buttons and data fields. The interface is organized into several sections:

- Top Row (Buttons 1-12):** Includes icons for power (1), hand (3), blade (5), home (7), Cutting Mode (8), blade descend (10), left/right arrows (11), and bidirectional arrows (12).
- Second Row (Buttons 2-15):** Includes icons for power (2), water tap (4), blade (6), Auto Swivel (9), blade descend (13), left/right arrows (14), and bidirectional arrows (15).
- System/Status (16-17):** Buttons for System (16) and Status (17).
- Blade speed (22):** Set 0.0, Actual 0.0 ft/min.
- Blade Descend Clearance Check (24):** Includes a red and green indicator light.
- Down Feed (23):** Set 0.000, Actual 0.000 inch/min.
- Material Shape (25):** Set to Rectangular.
- NC100 Single Angle (18):** Button for material shape.
- Material Table (19):** Button for material table.
- PLC Monitor (20):** Button for PLC monitor.
- Error (21):** Button for error.
- Parameters (31):**
  - Feed Length: 0.000 inch
  - Total Feed Length: 0.000 inch
  - Width: 0.00 inch
  - Height: 0.000 inch
  - Angle: 0.0 degree
  - Guide Arm: 0.00 inch
  - Material ht. Sensor: 0.000 inch
  - Estimated Time: 0 : 0' 0"
  - Time Left: 0 : 0' 0"
- Bottom Row (Buttons 26-32):** Includes hand (26), blade descend (27), blade (28), Auto Swivel (29), blade descend (30), and a yellow bar (32).

Refer to the table below for descriptions of each function.

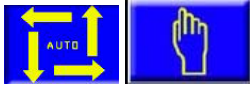

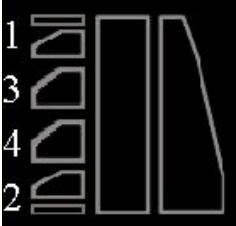





No	Item	Function	Description
1		Hydraulic start	<p>When the power is turned on, press this button to start the hydraulic motor.</p> <p>A solid yellow icon indicates the hydraulic system has been turned on.</p>
2		Hydraulic stop	<p>Press this button to turn off the hydraulic motor immediately.</p> <p> When the blade is running, the <i>hydraulic stop</i> button is temporarily disabled. You need to press the saw bow up button or the emergency stop button to stop the blade.</p>
3		AUTO/Single loop mode	<p>Use this button to switch between automatic and single loop mode.</p> <ul style="list-style-type: none"> <li>AUTO mode (): used to automatically perform continuous cutting steps. When switched to the AUTO mode, the machine will automatically operate according to the preset parameters. (See <i>Cutting Mode Setting &amp; Selecting</i> in later section).</li> <li>Single loop mode (): used to perform one single loop cutting step. When switched to the single loop mode, you can execute each individual function.</li> </ul>
4		Coolant ON/OFF	<p>Press this button to turn on the coolant pump.</p> <p>A solid yellow faucet icon indicates the coolant pump has been turned on.</p> <p>Press again to turn off the coolant pump.</p> <p> Under automatic mode, a started blade will also start the coolant.</p>
5		Carbide inserts clamp/unclamp	<p>When under setting mode, press this button to clamp carbide inserts. Press again to unclamp.</p> <p> The carbide inserts are programmed to automatically clamp</p>










No	Item	Function	Description
			when the saw blade starts in order to protect the blade and the user.
6		Projection light ON/OFF	<p>Press this button to turn on the projection light.</p> <p>A solid yellow light bulb icon indicates the projection light has been turned on.</p> <p>Press again to turn off the projection light.</p> <p> To save energy and extend bulb life, the projection light automatically turns off after 90 seconds.</p>
7		Home	<p>When under cutting mode, press this button to open the home window to perform return-to-rezo action. See <i>Home button</i> in later section.</p> <p> This action must be performed whenever the machine is restarted or the saw bow cannot move.</p>
8		Automatic cutting mode selection	When under setting mode, press this button to open the window to choose from three automatic cutting modes: loop multiple angle mode, NC100 single angle mode, and NC100 multiple angle mode. See <i>Cutting Mode Setting &amp; Selecting</i> in later section.
9		Saw bow automatically swivel	<p>When under cutting mode, press this button to open the automatically swivel window for adjusting mitering angle. See <i>Auto Swivel</i> in later section.</p> <p> <b>PLEASE STAY OUT OF SWIVELING AREA OR SEVERE INJURY OR DEATH MAY OCCUR!</b></p>
10		Guide arm automatic positioning function ON/OFF	<p>Press this button to turn on the guide arm automatic positioning function when under setting mode.</p> <p>With this function, the guide arm automatically moves in sync with the swiveling saw bow and positions itself at the best possible location based on the mitering angle.</p>



No	Item	Function	Description
11		Saw bow swivel speed fast/slow switch	Under setting mode, press this button to switch between the two speeds. Use the fast speed to quickly swivel the saw bow; then use the slow swivel speed to finely adjust to the desired angle.
12		System parameter setting	Press this button to enter parameter setting page to configure system parameters. Key in the password and press Enter to set up parameters.  All parameters have been set up by the manufacturer before shipment. As making random changes to these parameters will affect cutting precision and machine life, password is not provided to end users. Please consult your agent shall there be any need to reset machine parameters.
13		Status display & setting	Press this button to go to the next page where more machine status such as blade speed and downfeed rate is shown. See <i>Status Display &amp; Setting</i> in later section.
14		Cutting mode setting	Press No. 8 <i>Automatic cutting mode selection</i> button and the selection window will appear. After choosing an automatic cutting mode, corresponding mode button will appear at the right most of main control menu. Press the mode button to enter its setting page. See <i>Cutting Mode Setting</i> in later section.
15		Material cutting reference	This 3-page reference chart lists out the required blade speed and cutting rate for each different material.  <ul style="list-style-type: none"> <li>Press <i>Home</i> to return to the main control menu.</li> <li>Press <i>Page Down</i> to go to the next page.</li> </ul>
16		PLC signal monitor	This page shows current PLC signals.  <ul style="list-style-type: none"> <li>Press <i>Home</i> to return to the main control menu.</li> </ul>

No	Item	Function	Description
17	Error	Error report	<p>Lists a historical report of the errors and the time of occurrence as well as provides troubleshooting support.</p> <ul style="list-style-type: none"> <li>Press <i>Home</i> to return to the main control menu.</li> <li>Also refer to the Error Code Table for more information on error codes and possible solutions</li> </ul>
18	Blade Speed	Blade speed display & setting	<p>Figures next to “Actual” indicate current blade speed.</p> <p>To change blade speed, press the number icon to directly “set” the desired speed or press + or – icons to increase/decrease the speed.</p>
19	Down Feed	Blade downfeed speed display & setting	<p>Figures next to “Actual” indicate current saw blade downfeed speed i.e. how fast the blade descends.</p> <p>To change downfeed speed, press the number icon to directly “set” the desired speed or press + or - icons to increase/decrease the speed.</p>
20	Blade Descend Clearance Check	Blade descend clearance check & indicator	<ol style="list-style-type: none"> <li><i>Blade descend clearance check</i> button: Press this button to check clearance status. <ul style="list-style-type: none"> <li>Press Home to return to the main control</li> </ul> </li> <li>Clearance indicator: <ul style="list-style-type: none"> <li>Green light on: Indicates that saw bow is cleared and allowed to descend.</li> <li>Red light on: Indicates that saw bow is not allowed to descend due to clearance problem.</li> </ul> </li> </ol>
21	Material Shape	ROUND/RECTANGLE work cutting	<p>To save operation time, this machine incorporates a program which designates different quick approach height for round and rectangle work of different width. The blade will descend quickly to programmed quick approach height to save blade running time.</p> <p> When cutting rectangle shaped material such as I-beam, profiles and etc., be sure to switch to rectangle work cutting or the material might not be cut through and material and blade might damage.</p>



No	Item	Function	Description																				
26		Front vise automatic positioning function ON/ OFF	<p>With this function turned on, the front movable vise automatically moves and positions itself according to the mitering direction.</p> <p> While you are free to turn on or off the front vise automatic positioning function when using the setting mode, it is still highly recommended to have this function activated for faster operation.</p>																				
		Front movable vise position indicator	<p>This icon indicates which position the front movable vise has arrived at:</p> <ul style="list-style-type: none"> <li>• #1 icon turning solid white: front vise at rear limit</li> <li>• #3 icon turning solid white: front vise at rear middle limit</li> <li>• #4 icon turning solid white: front vise at front middle limit</li> <li>• #2 icon turning solid white: front vise at front limit</li> </ul> <p> <b>The front movable vise has to be at its respective required position to be able to perform the following miter-cuts:</b></p> <table border="1"> <thead> <tr> <th>Miter Direction</th> <th>HMI Angle Reading</th> <th colspan="2">Front Vise Position</th> </tr> </thead> <tbody> <tr> <td>Front (+)</td> <td>45° ~ 76°</td> <td>Rear middle limit</td> <td>Position 3</td> </tr> <tr> <td>Front (+), None (0), Back (-)</td> <td>76.1° ~ 90.1°</td> <td>Rear limit</td> <td>Position 1</td> </tr> <tr> <td>Back (-)</td> <td>90.2° ~ 96°</td> <td>Front limit</td> <td>Position 2</td> </tr> <tr> <td>Back (-)</td> <td>96.1° ~ 150°</td> <td>Front middle limit</td> <td>Position 4</td> </tr> </tbody> </table> <p> The blade will not start if the front movable vise is not at its required position. For better results, have the front vise automatic positioning function ON all the time.</p>	Miter Direction	HMI Angle Reading	Front Vise Position		Front (+)	45° ~ 76°	Rear middle limit	Position 3	Front (+), None (0), Back (-)	76.1° ~ 90.1°	Rear limit	Position 1	Back (-)	90.2° ~ 96°	Front limit	Position 2	Back (-)	96.1° ~ 150°	Front middle limit	Position 4
Miter Direction	HMI Angle Reading	Front Vise Position																					
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Back (-)	90.2° ~ 96°	Front limit	Position 2																				
Back (-)	96.1° ~ 150°	Front middle limit	Position 4																				
27		Shuttle vises feed speed FAST/SLOW	Press this button to switch the shuttle vise feed speed between fast (rabbit icon) and slow (snail icon).																				
		Shuttle vise position indicator	<p>Indicates the position of the shuttle vises: whether they have reached the front limit switch.</p> <p>When the shuttle vises have reached the front limit switch position, the shuttle vise icon at the front will turn solid white.</p>																				
28		Front/Rear vises status indicators	<p>When the vises have secured the work piece, the clamping vise icon on the right will turn solid white. Otherwise the unclamping vise icon on the left will be in solid green.</p>																				


No	Item	Function	Description		
			Vise	Unclamped	Clamped
			Rear		
			Front		
			 For manual cutting and automatic cutting with no trimming, both front and rear vises must be clamped before the blade is allowed to start cutting. For other automatic cutting, only rear vises must be clamped before the blade is allowed to start cutting.		
29		Front auxiliary top clamp UNCLAMPED/CLAMPED	Indicates if the front auxiliary top clamp is released or clamped. When it fully clamps the materials from top down, the vise icon on the right turns solid white.		
30		Saw blade up indicator	Indicates that the saw blade has risen to the point of touching the upper limit switch. When activated, the saw blade icon will turn solid white.		
		Quick approach height indicator	Indicates that the saw blade is above the "quick approach height" (including the upper limit position). When activated, the saw blade icon will turn solid white.		
		Saw blade down indicator	Indicates that a cut is completed and the saw blade is at its lowest position.  When the blade completes each cut and triggers the lower limit switch, the saw blade icon will turn solid white.		
31	<b>Feed Length</b>	Shuttle vise position / feed length display	Displays current position of the shuttle vise, which also indicates the length to be fed.		
	<b>Total Feed Length</b>	Shuttle vise multiple feed length display	Displays multiple feed length of the shuttle vise. It clears when the cutting completes.		
	<b>Width</b>	Front vise opening width display	Displays how wide the front vise is currently opened i.e. the horizontal distance between front movable vise and front fixed vise. Round material height is detected by the front vise opening width sensor.		
	<b>Height</b>	Saw bow height display	Displays current height of the saw bow.		



No	Item	Function	Description														
	<b>Angle</b>	Mitering angle display	Displays current mitering angle i.e. which angle is the saw bow swiveled to. <table border="1"> <thead> <tr> <th>Saw bow Miter Direction</th> <th>HMI Angle Reading</th> </tr> </thead> <tbody> <tr> <td>(Back) -60°</td> <td>150°</td> </tr> <tr> <td>(Back) -45°</td> <td>135°</td> </tr> <tr> <td>(Back) -30°</td> <td>120°</td> </tr> <tr> <td>(None) 0°</td> <td>90°</td> </tr> <tr> <td>(Front) +30°</td> <td>60°</td> </tr> <tr> <td>(Front) +45°</td> <td>45°</td> </tr> </tbody> </table>	Saw bow Miter Direction	HMI Angle Reading	(Back) -60°	150°	(Back) -45°	135°	(Back) -30°	120°	(None) 0°	90°	(Front) +30°	60°	(Front) +45°	45°
Saw bow Miter Direction	HMI Angle Reading																
(Back) -60°	150°																
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(Back) -30°	120°																
(None) 0°	90°																
(Front) +30°	60°																
(Front) +45°	45°																
	<b>Guide Arm</b>	Guide arm position display	Indicates the current position of the guide arm.														
	<b>Material ht. Sensor</b>	Material height sensor display	Displays how tall the rectangular material is. Rectangular material height is detected by the material height sensor.														
	<b>Estimated Time</b>	Estimated time	Estimated cutting time for current material under preset downfeed speed.														
	<b>Time Left</b>	Remaining cutting time display	Indicates the estimated remaining time for the current cut (step) to be finished.														
<b>32</b>	 (yellow highlight)	Error display	Displays error messages in the order of occurrences; press the message for 1 second to clear the messages.  The message must be cleared for the machine to continue to function normally.														


### Main Control Menu #7 : Home Button

Whenever the machine is restarted, “Home” action must be performed so that the saw bow and shuttle bed can return to zero position. Otherwise the saw bow would not come down and shuttle vise can only move in jog mode. Follow these steps to perform the action:

Step 1 – Press the hydraulic start button .


Step 2 – Switch to cutting mode .

Step 3 - Press the home icon  and the following window will appear .

Step 4 – Press the home icon  and the machine will perform the following “Home” action. First the saw bow will move up to the upper limit position. Then the saw bow will swivel to 45° (return-to-zero point of

mitering angle) then 90°. Next both front and rear vises will fully open. Rear vise will move back to rear limit position as its return-to-zero point. Front vise will move from position 1 to 3 then back to 1 (please refer main control menu No. 26 front movable vise position).








To stop the home action, press either the home icon  or the saw bow up button.

Step 5 – Press the close icon  to close the window.

### Main Control Menu #8 : Cutting Mode Setting & Selecting




When under setting mode, press this button  to open the window  to choose from three automatic cutting modes: loop multiple angle mode, NC100 single angle mode, and NC100 multiple mode.

- Loop multiple angle mode (  ): used when a product is formed under 4 continuously loop cutting steps. Product quantity can be counted for this mode.
- NC 100 single angle (  ): used when the product is formed with the same mitering angle cuttings. Product quantity can be counted for this mode.
- NC 100 multiple angle (  ): used for those multiple angle product which cannot be formed with loop multiple angle mode. Product quantity cannot be counted but cutting step quantity can for this mode.


### Main Control Menu #9 : Auto Swivel button

Use this button to swivel the saw bow to its mitering angle. Follow these steps to perform the action:


Step 1– Switch to cutting mode .


Step 2 – Press the auto swivel icon  and the following window will appear .

Step 3 – Press the  icon and enter the desired mitering angle( 45°~150°).

Step 4 – Press the auto swivel icon  and saw bow will automatically rise to the upper limit position then swivel to preset angle.




To stop the swiveling, press either the auto swivel icon  or the saw bow up button.

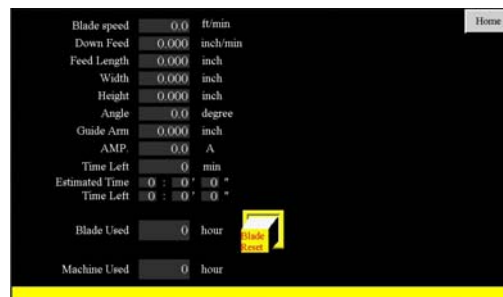
Step 5 – Press the close icon  to close the window.

## Main Control Menu #17 Status: Status Display & Setting

Display/Button	Description
Blade Speed	Current blade speed display
Down Feed	Current downfeed speed display
Feed Length	Shuttle vise position / feed length display
Width	Front vise opening width display
Height	Saw bow height display
Angle	Mitering angle display
Guide Arm	Guide arm position display
AMP.	Blade motor current display
Time Left	Remaining cutting time display (in min. only)
Estimated Time	Estimated cutting time for current material under preset downfeed speed
Time Left	Remaining cutting time display (same as above Time Left but in hr., min. and sec.)

*\*\* For more information on above displays, please refer back to main control menu.*

Blade Used	Displays the amount of time in hours that the current blade has been used.
	Blade reset button. After a new blade is installed, press this button to reset the blade used back to zero.
Machine Used	Displays the amount of time in hours the machine has been used.



## Main Control Menu #18 Status: Status Display & Setting

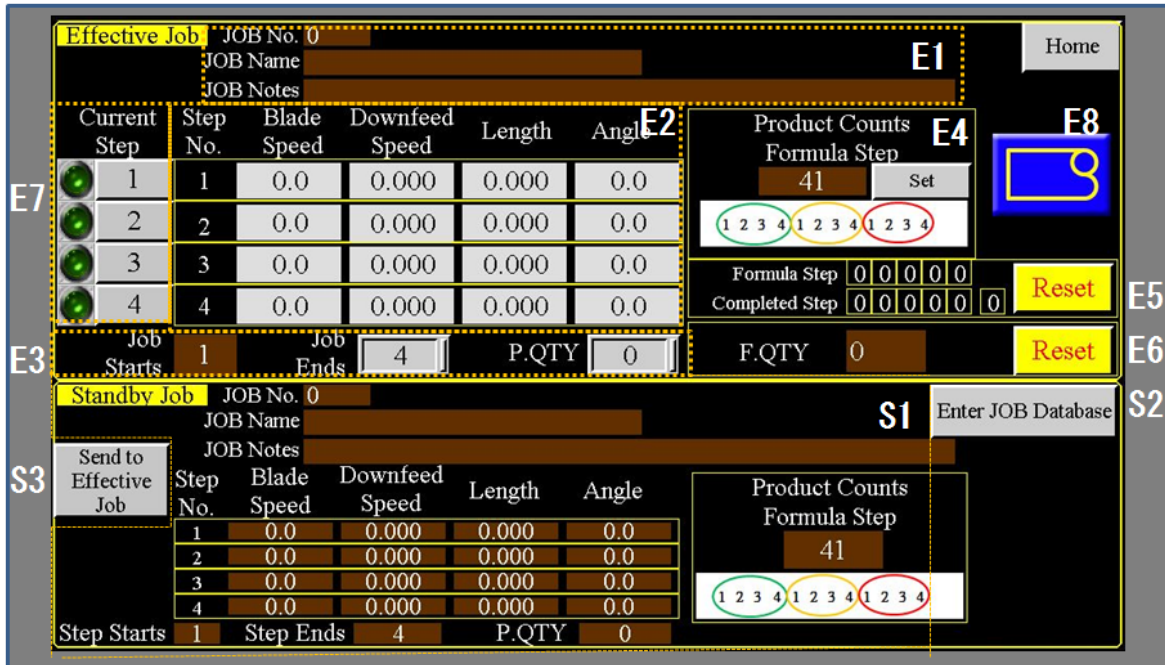
After choosing an automatic cutting mode, corresponding mode button will appear at the right most of main control menu. Press the mode button to enter its setting page. Refer below descriptions for the following automatic cutting mode: loop multiple angle mode, NC100 single angle mode and NC100 multiple angle mode.

## Loop multiple angle mode

The *Cutting Job Setting and Selecting Page* is divided into two work zones: Effective Job and Standby Job.

Effective Job Zone is where the cutting job in action can be monitored, re-edited and used for re-work.

Standby Job Zone is where cutting data can be retrieved from database or external memory for users to start preparing for the next cutting job.










## Effective Job Work Zone

### E1: Job Info

Display/Button	Description
Job No.	Job number in effect
Job Name	Name of the job in effect. For job naming, refer to Job Database in later section.
Job Notes	Supplementary notes about the job in effect. For adding job notes, refer to Job Database in later section.




## E2: Job Step Info Display & Re-Program (1)

Display/Button	Description
Step No.	Lists out the steps programmed in the effective job. Each job can include up to four cutting steps.
Blade Speed	<p>Displays the preset blade speed for each given step. Blade speed can be reprogrammed by directly pressing the number icon and entering a new speed.</p> <p> The new speed will take effect at the next time the given step is executed. Changing blade speed while the given step is being executed will not take immediate effect.</p> <p> If you wish to change speed of the current running blade, use the <i>blade speed control</i> buttons on the HMI home menu.</p>
Downfeed speed	<p>Displays the preset downfeed speed for each given step. Downfeed speed can be reprogrammed by directly pressing the number icon and entering a new speed.</p> <p> The new speed will take effect the next time the given step is executed. Changing blade downfeed speed while the given step is being executed will not take immediate effect.</p> <p> If you wish to change downfeed speed of the current running blade, use the downfeed speed control buttons on the HMI home menu.</p>
Length	<p>Displays the preset feed length for each given step to cut. Feed length can be reprogrammed by directly pressing the number icon and entering a new feed length.</p> <p> The new length will take effect the next time the given step is executed. Changing feed length while the given step is being executed will not take immediate effect.</p> <p> If no trimming is needed, there will not be any feeding for the first cut of the first step. The saw will cut where material is fed and clamped at.</p>
Angle	<p>Displays the preset mitering angle for each given step. Angle can be reprogrammed by directly pressing the number icon and entering a new angle.</p> <p> The new angle will take effect the next time the given step is executed. Changing mitering angle while the given step is being executed will not take immediate effect.</p>

Step No.	Blade Speed	Downfeed Speed	Length	Angle
1	0.0	0.000	0.000	0.0
2	0.0	0.000	0.000	0.0
3	0.0	0.000	0.000	0.0
4	0.0	0.000	0.000	0.0

### E3: Job Step Info Display & Re-Program (2)

Display/Button	Description
Step Starts	The starting step is set to be 1 at default. No change is allowed.
Step Ends	Displays the ending step number, which can also be reprogrammed by directly pressing the number icon.  If product needs two steps to form, set step end at 2. The given example on the right means cutting starts at Step 1 and ends with Step 4.
P. Qty	Displays the quantity of cut-off work the user wishes to produce. The quantity can be reprogrammed by directly pressing the number icon and entering a new product quantity.   Changing the product quantity during automatic cutting is allowed. Once it is changed, the machine will continue to cut until reaching the new product quantity. If the new quantity is smaller than the finished quantity, the machine will stop right after completing the cut.



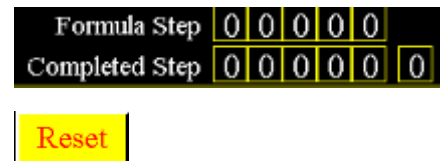
### E4: Product Count Formula Display & Re-Program

Display/Button	Description
Product Count Formula	Displays the formula number chosen for the effective job. In this example, the formula number is 41.
Set	Press this button to enter the <i>Product Count Formula Selection</i> page, where the user can choose a calculation formula for product count. (See explanations on <i>Selecting Product Count Formula</i> in later section.)
Formula Icon	Displays the corresponding formula graphic for the formula chosen. In this example, the formula graphic corresponds to formula number 41.



### E5: Job Step Info Display & Re-Program (3)

Display/Button	Description
Formula Step	Displays the step numbers in sequence as prescribed in the chosen formula. Ex: For formula 41, <i>Formula Step</i> would show 0 1 2 3 4.
Completed Step	Displays the step numbers in sequence as they are being completed while the machine runs. This is a great monitor tool to better understand cutting step sequence and when a finished cutoff product can be expected.  The slot at the furthest right indicates the step number in action. Upon completion of a step, the step number(s) in view move to the left by one slot; once the <i>completed step</i> sequence matches the <i>formula step</i> from above, product count adds by one. This procedure repeats until the product quantity is reached and cutting ends.
Reset	Press this button for 3 seconds to clear all numbers in <i>Completed Step</i> slots.





Two examples listed below provides a step-by-step explanation of how the product quantity is counted with the *formula step* sequence looks for matching numbers from below while the completed step sequence enters from right to left and moves from slot to slot as each cutting step completes.


Sequence	Example: Formula 21	Sequence	Example: Formula 24																												
Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	0	0	1	Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </table>	Formula Step	0	0	1	2	1		Completed Step	0	0	0	0	0	1
Formula Step	0	0	0	1	2																										
Completed Step	0	0	0	0	0	1																									
Formula Step	0	0	1	2	1																										
Completed Step	0	0	0	0	0	1																									
Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	0	1	2	Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	1	2	1		Completed Step	0	0	0	0	1	2
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Formula Step	0	0	1	2	1																										
Completed Step	0	0	0	0	1	2																									
→Step 2 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> </table> P.Qty = 1	Formula Step	0	0	0	1	2		Completed Step	0	0	0	1	2		Starting step1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td></tr> </table>	Formula Step	0	0	1	2	1		Completed Step	0	0	0	1	2	1
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Completed Step	0	0	0	1	2																										
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Completed Step	0	0	0	1	2	1																									
Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	1	2	1	→Step 1 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> </table> P.Qty = 1	Formula Step	0	0	1	2	1		Completed Step	0	0	1	2	1	
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Completed Step	0	0	0	1	2	1																									
Formula Step	0	0	1	2	1																										
Completed Step	0	0	1	2	1																										
Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	1	2	1	2	Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	1	2	1		Completed Step	0	0	1	2	1	2
Formula Step	0	0	0	1	2																										
Completed Step	0	0	1	2	1	2																									
Formula Step	0	0	1	2	1																										
Completed Step	0	0	1	2	1	2																									
→Step 2 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>1</td><td>2</td><td>1</td><td>2</td><td></td></tr> </table> P.Qty = 2	Formula Step	0	0	0	1	2		Completed Step	0	1	2	1	2		Starting step1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td></tr> </table>	Formula Step	0	0	1	2	1		Completed Step	0	1	2	1	2	1
Formula Step	0	0	0	1	2																										
Completed Step	0	1	2	1	2																										
Formula Step	0	0	1	2	1																										
Completed Step	0	1	2	1	2	1																									
Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	1	2	1	2	1	→Step 1 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td><td></td></tr> </table> P.Qty = 2	Formula Step	0	0	1	2	1		Completed Step	1	2	1	2	1	
Formula Step	0	0	0	1	2																										
Completed Step	0	1	2	1	2	1																									
Formula Step	0	0	1	2	1																										
Completed Step	1	2	1	2	1																										
Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	1	2	1	2	1	2																
Formula Step	0	0	0	1	2																										
Completed Step	1	2	1	2	1	2																									
→Step 2 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>2</td><td>1</td><td>2</td><td>1</td><td>2</td><td></td></tr> </table> P.Qty = 3	Formula Step	0	0	0	1	2		Completed Step	2	1	2	1	2																	
Formula Step	0	0	0	1	2																										
Completed Step	2	1	2	1	2																										

### E6: Finished Product Quantity

Display/Button	Description
Finished Quantity	Displays the current quantity of finished product.
Reset	Press this button for 3 seconds to clear <i>Finished Quantity</i> number.





### E7: Current Step Indicator & Step Restart Button


Display/Button	Description
Green Light	The green indicator lights on the left point to the current cutting step in action.
Number Icon	There may be occasions where a cutting step is halted and needs to be restarted. At a time like this, press the step number icon which requires restart or rework and continue on with the original cutting program.  Current step is not necessary step 1. Set according to your need.

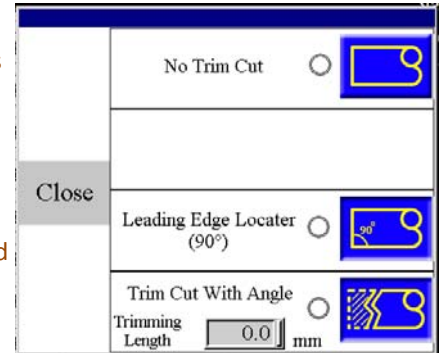














## E8: Trim Cut Selecting

Press Trim Cut icon and selecting window will pop out.

 This machine incorporates a 90° leading edge (  ) locator function. It cannot locate non 90° leading edge. If this function is desired but leading edge is not 90°, cut the leading edge as 90° first. If the material head is an incline plane, locating leading edge might cause front vise clamping the incline plane and damage the machine.


 Before locating the leading edge, put the material in between rear vise and edge locator sensor, about 400mm extending from the rear vise.



Display/Button	Description						
No Trim Cut 	Indicates trim cut is not needed.   Before cutting, both front and rear vises need to be clamped. Either one not clamped might cause damage to the machine. After starting the blade, in order to avoid “-” angle cutting causes front vise clamping the incline plane, machine will release the front vise automatically.						
Leading Edge Locator (90°) 	Indicates locating material leading edge is needed and current step angle is 90° .  After machine has located the edge, current step is seen completed. Therefore the current step angle must be 90° or the cutting will not start.   Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.						
Trim Cut With Angle 	Indicates locating material leading edge is needed and current step angle is NOT 90° .  After machine has located the edge, machine will swivel to trim cut angle, feed the trim cut length Trimming Length <input type="text" value="0.000"/> and enter) then trim cut. When trim cut is done, current step is seen completed.  <table border="1" data-bbox="375 1581 1008 1854"> <thead> <tr> <th>Trim cut angle</th> <th>Trimming length position</th> </tr> </thead> <tbody> <tr> <td>“+” angle</td> <td></td> </tr> <tr> <td>“-” angle</td> <td></td> </tr> </tbody> </table>   Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.	Trim cut angle	Trimming length position	“+” angle		“-” angle	
Trim cut angle	Trimming length position						
“+” angle							
“-” angle							

## Standby Job Work Zone

### S1: Standby Job Info

Display/Button	Description
Job No. Job Name Job Notes Step No. Blade Speed Downfeed Speed Length Angle Step Starts Step Ends Product Quantity Product Count Formula	<p>All the standby job information listed on the left are retrieved from the job database. As they are displays only, no editing is allowed in this work zone. For explanations, please refer to <i>Effective Job Work Zone: E1~E4</i> from earlier sections.</p> <p> Standby Job Zone is where cutting data can be retrieved from database or external memory for users to start preparing for the next cutting job.</p>

### S2: Enter JOB Database Page

Display/Button	Description
Enter JOB Database	Press this button to enter the JOB database page, where data of a total of 500 cutting jobs can be loaded from external memory, reprogrammed, and saved. The selected cutting job then will be displayed in the Standby Job work zone as previously introduced. See JOB Database Page for more information.

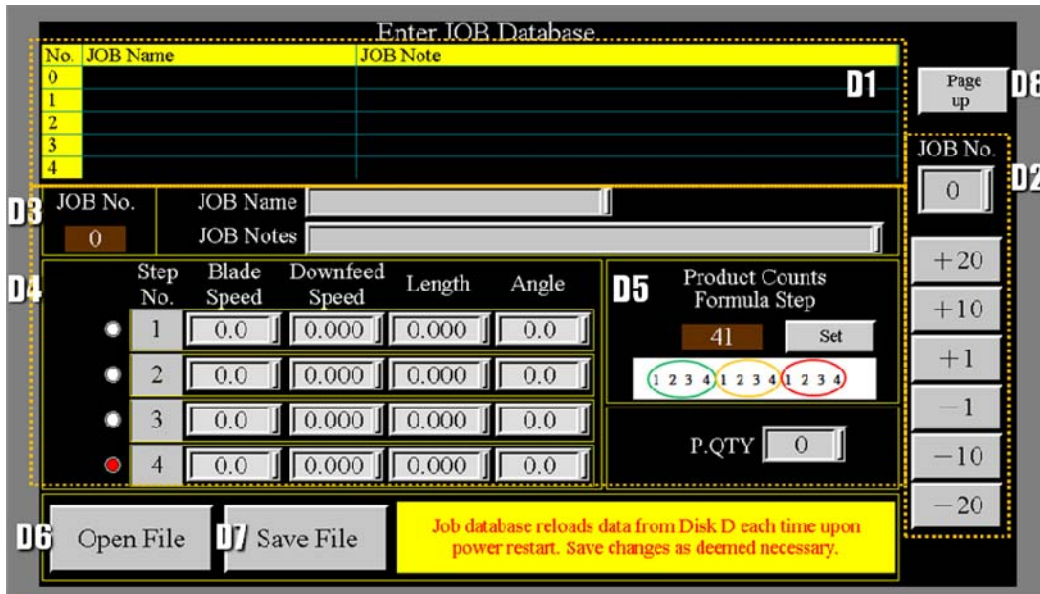
Enter JOB Database

### S3: Standby Job Info

Display/Button	Description
Send to Effective Job	Press this button to send all standby job info to the effective job work zone. Use this button when it is time to work on a new cutting job.

Send to Effective Job

# JOB Database



## D1: Cutting Jobs in Database

This window lists out the cutting jobs stored in the database. To recall a cutting job, use D2 buttons to quickly jump to other jobs.

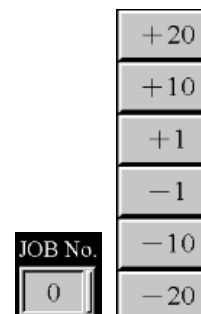
Display/Button	Description
Job No.	Job number
Job Name	Name of the job
Job Notes	Supplementary notes about the job

No.	JOB Name	JOB Note
0		
1		
2		
3		
4		

## D2: Jumping to & Recalling A Cutting Job

Use these convenient buttons to jump to and recall a certain cutting job.

Display/Button	Description
Job No.	Press the number icon and directly enter the job number to jump to.
+20	Jump ahead 20 jobs.
+10	Jump ahead 10 jobs.
+1	Jump to the next cutting job.
-1	Jump back to previous cutting job.
-10	Jump backward 10 jobs.
-20	Jump backward 20 jobs.




### D3: Editing the Standby Cutting Job (1)

Display/Button	Description
Job No.	Displays the job number recalled for standby work zone
Job Name	Displays the name of the job recalled for standby work zone. Editing is allowed. Press the gray text area to start editing.
Job Notes	Displays supplementary notes about the job recalled for standby work zone. Editing is allowed. Press the gray text area to star editing.



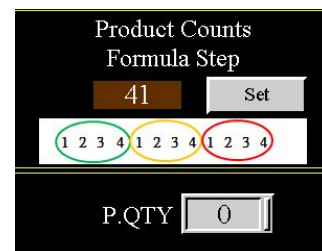
### D4: Editing the Standby Cutting Job (2)

Display/Button	Description
Step No.	Lists out the steps programmed in the effective job. Each job can include up to four cutting steps.  Red light on the left indicates ending step. For example, if only step 1 to 3 are required, press the “3” number icon then red light will jump to step 3 and step 4 information will disappear.
Blade Speed	Displays the preset blade speed for each given step. Blade speed can be reprogrammed by directly pressing the number icon and entering a new speed.
Downfeed speed	Displays the preset downfeed speed for each given step. Downfeed speed can be reprogrammed by directly pressing the number icon and entering a new speed.
Length	Displays the preset feed length for each given step to cut. Feed length can be reprogrammed by directly pressing the number icon and entering a new feed length.   If no trimming is needed, there will not be any feeding for the first cut of the first step. The saw will cut where material is fed and clamped at.
Angle	Displays the preset mitering angle for each given step. Angle can be reprogrammed by directly pressing the number icon and entering a new angle.




### D5: Editing the Standby Cutting Job (3)

Display/Button	Description
Product Count Formula	Displays the formula number chosen for the effective job. In this example, the formula number is 41.
Set	Press this button to enter the <i>Product Count Formula Selection</i> page, where the user can choose a calculation formula for product count. (See explanations on <i>Product Count Formula Selection</i> in later section.)
Formula Icon	Displays the corresponding formula graphic for the formula chosen. In this example, the formula graphic corresponds to formula number 41.
P. Qty (Product Quantity)	Displays the quantity of cut-off work the user wishes to produce. The quantity can be reprogrammed by directly pressing the number icon and entering a new product quantity.




### D6: Loading Data from Memory

Display/Button	Description						
Open File	<p>Press this button to open a cutting job file from internal or external memory drive. When a dialogue box pops out, select the file you wish to load data from.</p> <p>At default, the job database automatically reloads a default worksheet file from Disk D each time upon machine restart.</p> <table border="1"> <tr> <td>Default file name</td> <td>For Metric system: work.csv For Imperial system: work_I.csv</td> </tr> <tr> <td>Default memory</td> <td>Disk D (Micro SD plugged into HMI system at time of manufacture)</td> </tr> <tr> <td>Optional memory</td> <td>Disk E (USB socket on the control panel)</td> </tr> </table> <p> Shall you decide to use data from another file that has been edited on a computer, pay extra attention to the file that all column names, formats and order of arrangement should never be changed in any way as doing so will lead to incorrect data loading.</p>	Default file name	For Metric system: work.csv For Imperial system: work_I.csv	Default memory	Disk D (Micro SD plugged into HMI system at time of manufacture)	Optional memory	Disk E (USB socket on the control panel)
Default file name	For Metric system: work.csv For Imperial system: work_I.csv						
Default memory	Disk D (Micro SD plugged into HMI system at time of manufacture)						
Optional memory	Disk E (USB socket on the control panel)						

Open File

### D7: Saving Data to Memory

Display/Button	Description						
Save File	<p>Press this button to save current cutting job data to an external memory drive (Disk D for the Micro SD plugged in the HMI system or disk E for your option of memory stick (flash drive) plugged to the USB socket on the control panel)</p> <table border="1"> <tr> <td>Default file name</td> <td>For Metric system: work.csv For Imperial system: work_I.csv</td> </tr> <tr> <td>Default memory drive</td> <td>Disk D for Micro SD plugged into HMI system at time of manufacture</td> </tr> <tr> <td>Optional memory drive</td> <td>Disk E for optional memory stick (flash drive) connected to the USB socket on the control panel</td> </tr> </table> <p> As the job database automatically reloads data from Disk D each time upon machine restart, it is important to save your work before turning off the machine.</p>	Default file name	For Metric system: work.csv For Imperial system: work_I.csv	Default memory drive	Disk D for Micro SD plugged into HMI system at time of manufacture	Optional memory drive	Disk E for optional memory stick (flash drive) connected to the USB socket on the control panel
Default file name	For Metric system: work.csv For Imperial system: work_I.csv						
Default memory drive	Disk D for Micro SD plugged into HMI system at time of manufacture						
Optional memory drive	Disk E for optional memory stick (flash drive) connected to the USB socket on the control panel						

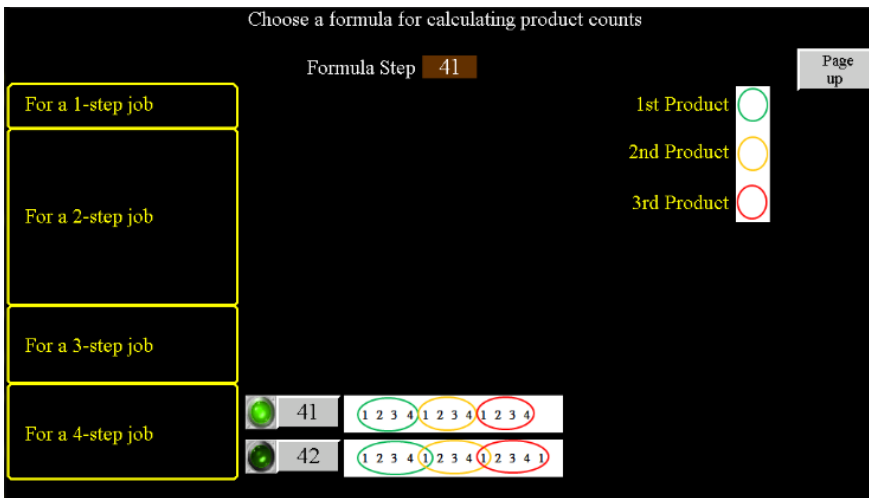
Save File

### D8: Return to Cutting Job Setting & Selecting Page

Display/Button	Description
Page Up	Press this button to return to the cutting job setting and selecting page. The cutting job recalled will be shown in the standby cutting job section.

Page up

## Selecting Product Count Formula



### 1 Select a job type.

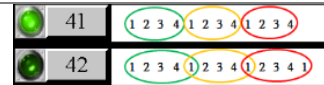
Based on the number of steps your cutting job includes, select the corresponding job type. For example, press anywhere within the bracket which writes “For a 4-step job” if you wish to execute a four-step job, then a list of option on calculation formula will pop out.

For a 4-step job

### 2 Select a formula from the options provided.

From the options provided, select the desired calculation formula and press the corresponding formula number key. The green light will come on for the formula number selected.

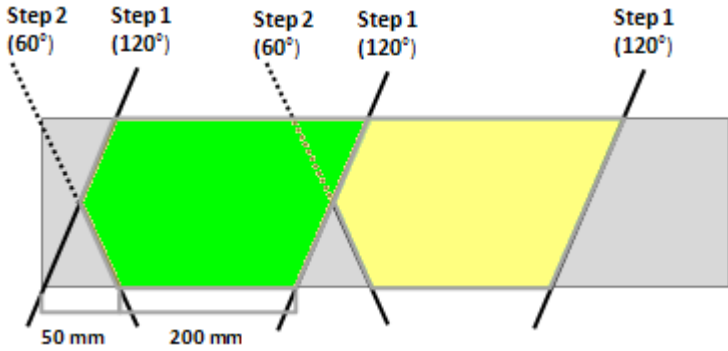

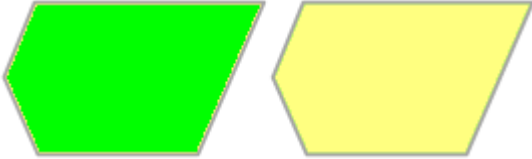
Refer to *Calculation Formula Options* below for further details.



## Calculation Formula Options

Choosing the calculation formula right is important to getting a correct product count. An example is provided below to explain the concept of cutting step, cutting sequence and the different ways of producing a cutoff product.

Example:

<p>Step Setting</p>	<table border="1" data-bbox="443 533 880 654"> <thead> <tr> <th>Step</th> <th>Angle</th> <th>Feed Length</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>120°</td> <td>200 mm</td> </tr> <tr> <td>2</td> <td>60°</td> <td>50 mm</td> </tr> </tbody> </table> <p style="margin-left: 200px;"> <i>Step starts = 1</i>  <i>Step ends = 2</i>  <i>P. Qty = 2</i> </p>	Step	Angle	Feed Length	1	120°	200 mm	2	60°	50 mm
Step	Angle	Feed Length								
1	120°	200 mm								
2	60°	50 mm								
<p>Cutting Sequence (illustrated)</p>										
<p>Calculation Formula</p>	<p>Formula No: <b>24</b></p> <p>Representing formula graphic: </p> <p>Numbers inside the circle represents step number. A circle represents a finished product.</p> <p><u>Explanation in detail:</u> In the first (green) circle, it requires the completion of three steps i.e. step 1, step 2 and then step 1 in order to account for one finished product. (As shown in cutting sequence illustrated above, it takes the second “step 1” to have one “cut off” finished product.) The second (yellow) circle i.e. the second product, likewise, requires completing three steps to get the cut-off piece; however, since its required first step has already been executed as the final step in the first (green) circle, only two more steps are required for the second piece to come off.</p>									
<p>Finished Product</p>	 <p>Finished Product Quantity: <b>2</b></p>									

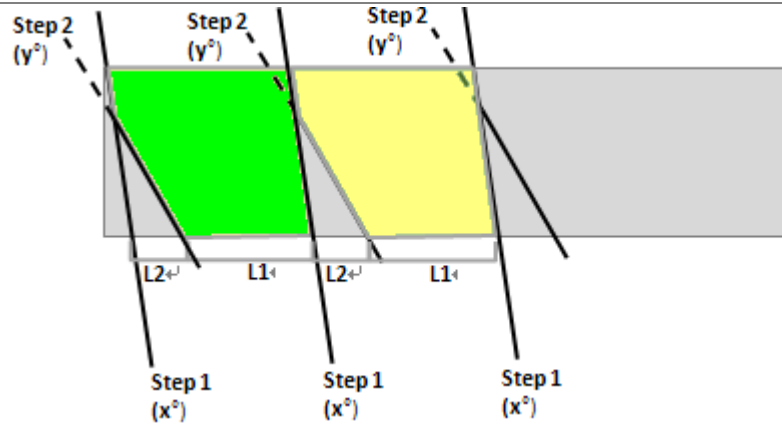


For a 1-step job	Formula No.	<b>1</b>	Formula Graphic															
	Formula Step	Cut 1 Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </table>	Formula Step	0	0	0	0	1		Completed Step	0	0	0	0	0	1	P.Qty = 1
	Formula Step	0	0	0	0	1												
Completed Step	0	0	0	0	0	1												
	→ Step 1 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td></td></tr> </table>	Formula Step	0	0	0	0	1		Completed Step	0	0	0	0	1			
Formula Step	0	0	0	0	1													
Completed Step	0	0	0	0	1													
Example Cutting Sequence																		

For a 2-step job	Formula No.	<b>21</b>	Formula Graphic															
	Formula Step	Cut 1 Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	0	0	1	P.Qty = 1
	Formula Step	0	0	0	1	2												
Completed Step	0	0	0	0	0	1												
	Cut 2 Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	0	1	2		
Formula Step	0	0	0	1	2													
Completed Step	0	0	0	0	1	2												
	→ Step 2 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr> </table>	Formula Step	0	0	0	1	2		Completed Step	0	0	0	1	2			
Formula Step	0	0	0	1	2													
Completed Step	0	0	0	1	2													
Example Cutting Sequence																		

	Formula No.	<b>22</b>	Formula Graphic															
	Formula Step	Cut 1 Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </table>	Formula Step	0	0	0	2	1		Completed Step	0	0	0	0	0	1	P.Qty = 1
	Formula Step	0	0	0	2	1												
Completed Step	0	0	0	0	0	1												
	Cut 2 Starting step 2	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td></tr> </table>	Formula Step	0	0	0	2	1		Completed Step	0	0	0	0	1	2		
Formula Step	0	0	0	2	1													
Completed Step	0	0	0	0	1	2												
	Cut 3 Starting step 1	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td></tr> </table>	Formula Step	0	0	0	2	1		Completed Step	0	0	0	1	2	1		
Formula Step	0	0	0	2	1													
Completed Step	0	0	0	1	2	1												
	→ Step 1 ends	<table border="1"> <tr><td>Formula Step</td><td>0</td><td>0</td><td>0</td><td>2</td><td>1</td><td></td></tr> <tr><td>Completed Step</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td></td></tr> </table>	Formula Step	0	0	0	2	1		Completed Step	0	0	1	2	1			
Formula Step	0	0	0	2	1													
Completed Step	0	0	1	2	1													

Example Cutting Sequence



Formula No.

**23**

Formula Graphic



Formula Step

Cut 1 Starting step 1

Formula Step	0	0	0	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	0	0	1
----------------	---	---	---	---	---	---

Cut 2 Starting step 2

Formula Step	0	0	0	1	2	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	0	1	2
----------------	---	---	---	---	---	---

→ Step 2 ends

Formula Step	0	0	0	1	2	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	1	2	
----------------	---	---	---	---	---	--

P.Qty = 1

Cut 3 Starting step 1

Formula Step	0	0	0	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	1	2	1
----------------	---	---	---	---	---	---

→ Step 1 ends

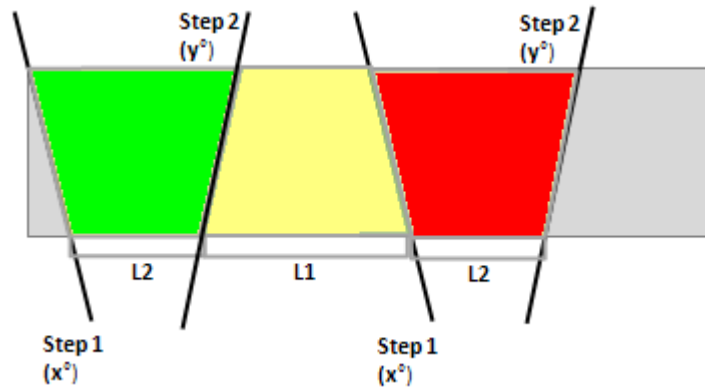
Formula Step	0	0	0	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	1	2	1	
----------------	---	---	---	---	---	--



Formula step switches between  $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$  and  $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$  depending on which step is being executed. Formula No. 23 is the only formula that does so for automatic cutting.

Example Cutting Sequence



Formula No.

**24**

Formula Graphic



Formula Step

Cut 1 Starting step 1

Formula Step	0	0	1	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	0	0	1
----------------	---	---	---	---	---	---

Cut 2 Starting step 2

Formula Step	0	0	1	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	0	1	2
----------------	---	---	---	---	---	---

Cut 3 Starting step 1

Formula Step	0	0	1	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	0	1	2	1
----------------	---	---	---	---	---	---

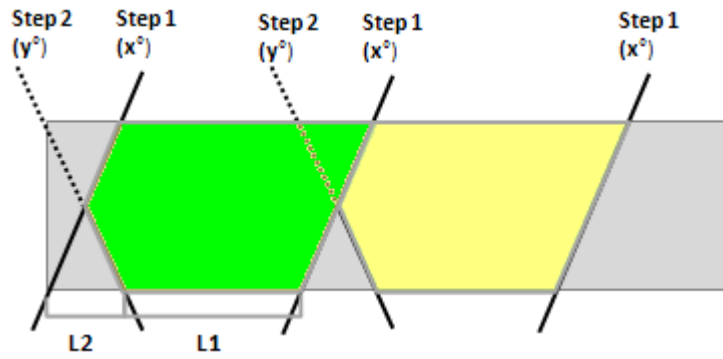
→ Step 1 ends

Formula Step	0	0	1	2	1	
--------------	---	---	---	---	---	--

Completed Step	0	0	1	2	1	
----------------	---	---	---	---	---	--

P.Qty = 1

Example Cutting Sequence

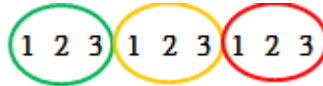


For a 3-step job

Formula No.

**31**

Formula Graphic



Formula Step

Cut 1 Starting step 1

Formula Step	0	0	1	2	3	
--------------	---	---	---	---	---	--

Cut 2 Starting step 2

Formula Step	0	0	1	2	3	
--------------	---	---	---	---	---	--

Cut 3 Starting step 3

Formula Step	0	0	1	2	3	
--------------	---	---	---	---	---	--

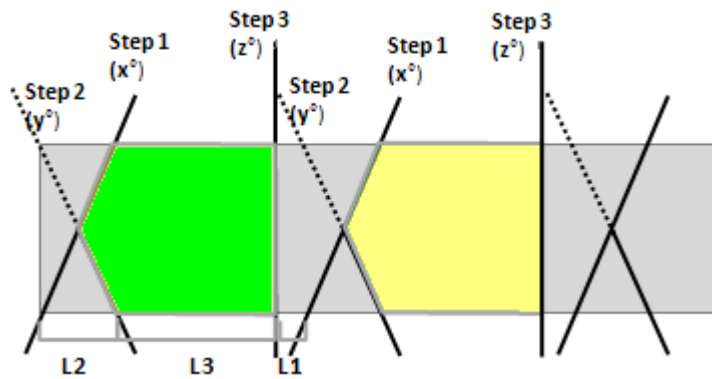
→Step 3 ends

Formula Step	0	0	1	2	3	
--------------	---	---	---	---	---	--

P.Qty = 1

Completed Step	0	0	1	2	3	
----------------	---	---	---	---	---	--

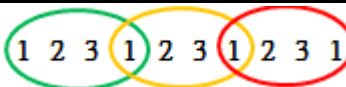
Example Cutting Sequence



Formula No.

**32**

Formula Graphic



Formula Step

Cut 1 Starting step 1

Formula Step	0	1	2	3	1	
--------------	---	---	---	---	---	--

Cut 2 Starting step 2

Formula Step	0	1	2	3	1	
--------------	---	---	---	---	---	--

Cut 3 Starting step 3

Formula Step	0	1	2	3	1	
--------------	---	---	---	---	---	--

Cut 4 Starting step 1

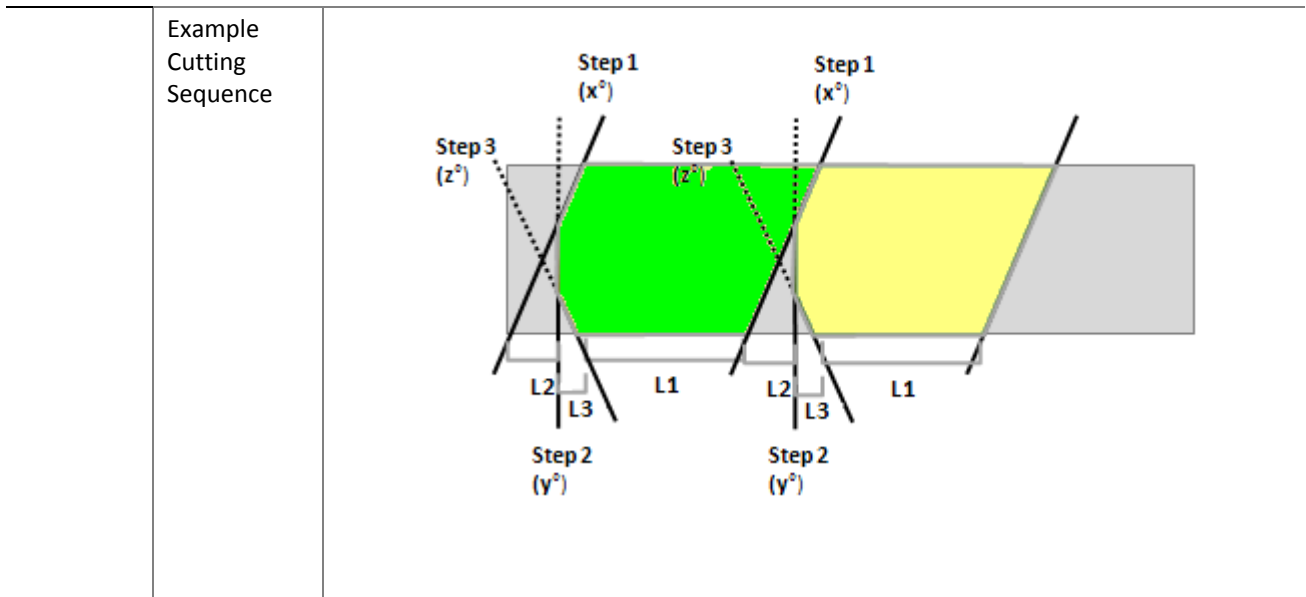
Formula Step	0	1	2	3	1	
--------------	---	---	---	---	---	--

→Step 1 ends

Formula Step	0	1	2	3	1	
--------------	---	---	---	---	---	--

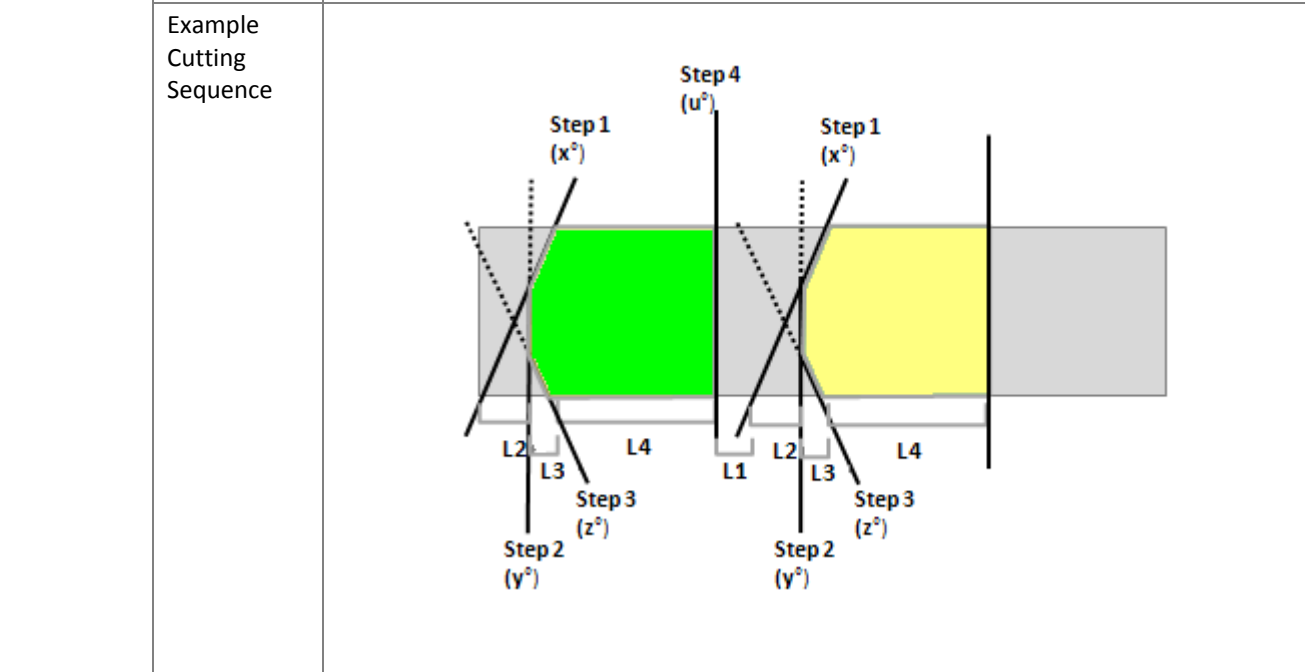
P.Qty = 1

Completed Step	0	1	2	3	1	
----------------	---	---	---	---	---	--



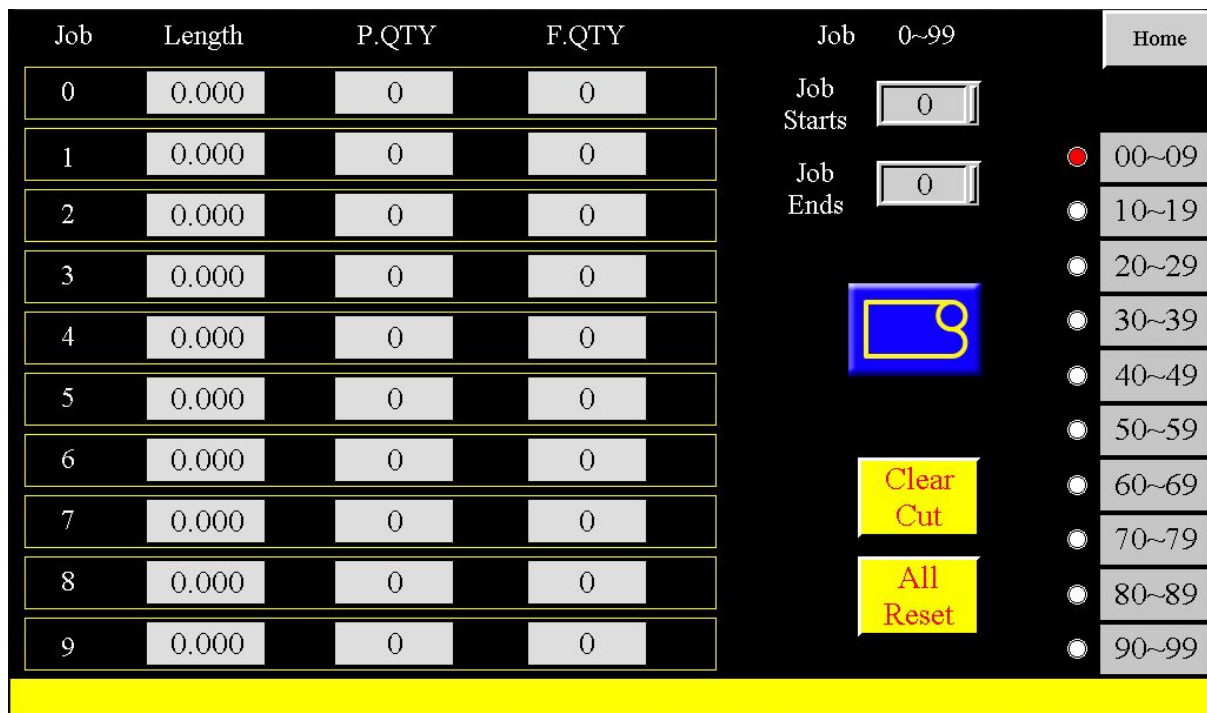
For a 4-step job



Formula No.	<b>41</b>	Formula Graphic	
Formula Step	Cut 1 Starting step 1	Formula Step	0 1 2 3 4
	Completed Step	Completed Step	0 0 0 0 0 1
	Cut 2 Starting step 2	Formula Step	0 1 2 3 4
	Completed Step	Completed Step	0 0 0 0 1 2
	Cut 3 Starting step 3	Formula Step	0 1 2 3 4
	Completed Step	Completed Step	0 0 0 1 2 3
	Cut 4 Starting step 4	Formula Step	0 1 2 3 4
	Completed Step	Completed Step	0 0 1 2 3 4
	→ Step 4 ends	Formula Step	0 1 2 3 4
		Completed Step	0 1 2 3 4
			P.Qty = 1



Formula No.	<b>42</b>	Formula Graphic							
Formula Step	Cut 1 Starting step 1	Formula Step	1	2	3	4	1		P.Qty = 1
		Completed Step	0	0	0	0	0	1	
	Cut 2 Starting step 2	Formula Step	1	2	3	4	1		
		Completed Step	0	0	0	0	1	2	
	Cut 3 Starting step 3	Formula Step	1	2	3	4	1		
		Completed Step	0	0	0	1	2	3	
	Cut 4 Starting step 4	Formula Step	1	2	3	4	1		
		Completed Step	0	0	1	2	3	4	
	Cut 5 Starting step 1	Formula Step	1	2	3	4	1		
		Completed Step	0	1	2	3	4	1	
	→Step 1 ends	Formula Step	1	2	3	4	1		
		Completed Step	1	2	3	4	1		
Example Cutting Sequence									

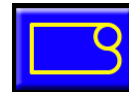
**NC100 single angle mode**



Display/Button	Description
Job	Job number
Length	Set the feed length for each given job to cut. Feed length can be reprogrammed by directly pressing the number icon and entering a new length.
P. Qty	Set the quantity of cut-off work the user wishes to produce. The quantity can be reprogrammed by directly pressing the number icon and entering a new product quantity.
F. Qty	Displays the current quantity of finished product.
Job Starts	Press the number icon and enter which job to start with. When current job is done, it will automatically jump to next job number.
Job Ends	Press the number icon and enter which job to end with.
Trim Cut Selecting	Press this icon  to select trim cut mode. Please refer below detail.
Clear Cut	Press this icon for three seconds to clear all the F. QTY.
All Reset	Press this icon for three seconds to clear all the setting.
Home	Press this icon to go back to the main control menu.
00~09	Cutting job setting page switch. Total 100 setting jobs (00~99).  Cutting job 01~04 setting is shared by loop multi angle mode, NC100 single angle mode, and NC100 multi angle mode. Cutting job 00, 05~99 setting is shared by NC100 single angle mode, and NC100 multi angle mode.

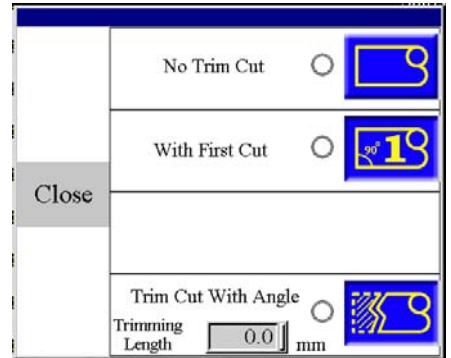
### E3: Trim Cut Selecting







Press Trim Cut icon and selecting window will pop out.




This machine incorporates the 90° leading edge ( ) locator function. It cannot locate non 90° leading edge. If this function is desired but leading edge is not 90°, cut the leading edge as 90° first before you use this function. If the material head is an incline plane, locating leading edge might cause front vise clamping the incline plane and damage the machine.


Before locating the leading edge, put the material in between rear vise and edge locator sensor, about 400mm extending from the rear vise.



Display/Button	Description						
No Trim Cut 	Indicates trim cut is not needed.  Before cutting, both front and rear vises need to be clamped. Either one not clamped might cause damage to the machine. After starting the blade, in order to avoid “-” angle cutting causes front vise clamping the incline plane, machine will release the front vise automatically.						
With First Cut 	Indicates locating material leading edge is needed and current step angle is 90°. <p>After machine has located the edge, machine will feed the first length and start cutting. When the cutting is done, the first product is formed and product count adds by one. Therefore the current step angle must be 90° or the cutting will not start.</p> Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.						
Trim Cut With Angle 	Indicates locating material leading edge is needed and current step angle is NOT 90°. <p>After machine has located the edge, machine will swivel to trim cut angle, feed the trim cut length</p> <p>Trimming Length <input type="text" value="0.000"/> (press and enter) then trim cut. When trim cut is done, cut piece is not yet a product. The machine continues to feed the first length and start cutting. When the cutting is done, the first product is formed and product count adds by one.</p> <table border="1"> <thead> <tr> <th>Trim cut angle</th> <th>Trimming length position</th> </tr> </thead> <tbody> <tr> <td>“+” angle</td> <td></td> </tr> <tr> <td>“-” angle</td> <td></td> </tr> </tbody> </table> Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.	Trim cut angle	Trimming length position	“+” angle		“-” angle	
Trim cut angle	Trimming length position						
“+” angle							
“-” angle							

## NC100 multi angle mode



Job	Blade Speed	Downfeed Speed	Length	Angle	P.QTY	F.QTY	Job 0~99	Home
0	0	0.0	0.0	0.0	0	0	Job Starts 0	
1	0	0.0	0.0	0.0	0	0	Job Ends 0	00~09
2	0	0.0	0.0	0.0	0	0		10~19
3	0	0.0	0.0	0.0	0	0		20~29
4	0	0.0	0.0	0.0	0	0		30~39
5	0	0.0	0.0	0.0	0	0		40~49
6	0	0.0	0.0	0.0	0	0		50~59
7	0	0.0	0.0	0.0	0	0	Clear Cut	60~69
8	0	0.0	0.0	0.0	0	0	All Reset	70~79
9	0	0.0	0.0	0.0	0	0		80~89
								90~99


Display/Button	Description
Job	Job number
Blade Speed	Set the blade speed for each given job to cut. Blade speed can be reprogrammed by directly pressing the number icon and entering a new speed.
Downfeed Speed	Set the downfeed speed for each given job to cut. Blade descend speed can be reprogrammed by directly pressing the number icon and entering a new speed.
Length	Set the feed length for each given job to cut. Feed length can be reprogrammed by directly pressing the number icon and entering a new length.
Angle	Set the miter angle for each given job to cut. Miter angle can be reprogrammed by directly pressing the number icon and entering a new angle.
P. Qty	Set the CUT NUMBER the user wishes to produce. The number can be reprogrammed by directly pressing the number icon and entering a new number.
F. Qty	Displays the current number of finished CUT.
Job Starts	Press the number icon and enter which job to start with. When current job is done, it will automatically jump to next job number.
Job Ends	Press the number icon and enter which job to end with.
Trim Cut Selecting	Press this icon  to select trim cut mode. Please refer below detail.
Clear Cut	Press this icon for three seconds to clear all the F. QTY.
All Reset	Press this icon for three seconds to clear all the setting.
Home	Press this icon to go back to the main control menu.
00~09	Cutting job setting page switch. Total 100 setting jobs (00~99).

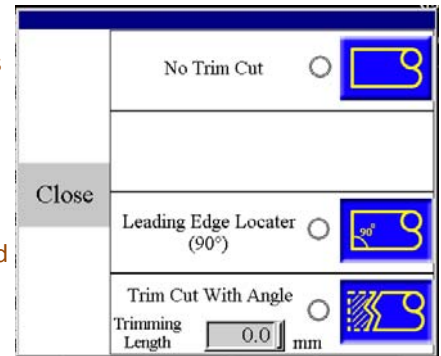














## E8: Trim Cut Selecting

Press Trim Cut icon and selecting window will pop out.

 This machine incorporates a 90° leading edge (  ) locator function. It cannot locate non 90° leading edge. If this function is desired but leading edge is not 90°, cut the leading edge as 90° first. If the material head is an incline plane, locating leading edge might cause front vise clamping the incline plane and damage the machine.

 Before locating the leading edge, put the material in between rear vise and edge locator sensor, about 400mm extending from the rear vise.



Display/Button	Description						
No Trim Cut 	Indicates trim cut is not needed.   Before cutting, both front and rear vises need to be clamped. Either one not clamped might cause damage to the machine. After starting the blade, in order to avoid “-” angle cutting causes front vise clamping the incline plane, machine will release the front vise automatically.						
Leading Edge Locator (90°) 	Indicates locating material leading edge is needed and current step angle is 90°.  After machine has located the edge, current step is seen completed and cut count adds by one. Therefore the current step angle must be 90° or the cutting will not start.   Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.						
Trim Cut With Angle 	Indicates locating material leading edge is needed and current step angle is NOT 90°.  After machine has located the edge, machine will swivel to trim cut angle, feed the trim cut length Trimming Length <input type="text" value="0.000"/> (press and enter) then trim cut. When trim cut is done, current step is seen completed and cut count adds by one. <table border="1" data-bbox="375 1541 1008 1816"> <thead> <tr> <th>Trim cut angle</th> <th>Trimming length position</th> </tr> </thead> <tbody> <tr> <td>“+” angle</td> <td></td> </tr> <tr> <td>“-” angle</td> <td></td> </tr> </tbody> </table>  Before cutting, rear vises need to be clamped and saw bow needs to be at upper limit position.	Trim cut angle	Trimming length position	“+” angle		“-” angle	
Trim cut angle	Trimming length position						
“+” angle							
“-” angle							

Error Code	Error Description	Further Description/Solution
M300	Front vises not clamped	Check if the queen valve works
M301	Rear vises not clamped	Check if the queen valve works
M303	Lower limit switch error	Check if the lower limit switch works
M304	Hydraulic motor not starting	Check if the hydraulic motor works
M305	Both front and rear vise clamped	Both front and rear vises are clamped and rear vises cannot move.
M306	Broken blade detected	1. Check if the speed switch works 2. Check if the blade is broken
M308	Left safety door abnormal	1. Check if the left safety door is shut properly 2. Check if the left safety door limit switch works
M309	Right safety door abnormal	1. Check if the right safety door is hut properly 2. Check if the right safety door limit switch works
M310	Inverter abnormal	Check the inverter
M313	OL1 abnormal	Check if the blade motor overload relay has tripped
M314	OL2 abnormal	Check if the hydraulic motor overload relay has tripped
M315	OL3 abnormal	Check if the coolant pump motor overload relay has tripped
M316	Saw bow upper limit abnormal	Check the upper limit switch works
M319	Cutting material clamped by top clamp	Cutting material is clamped by top clamp so rear vises cannot move.
M320	Front vise clamped: please open	Open the front vise before swiveling the saw bow under manual mode
M322	Work completed	P. Qty has achieved in loop multi angle mode
M323	Height A/D abnormal	Resistance scale incorrect reading. Check resistance scale and parameters.
M324	Front vise A/D abnormal	Resistance scale incorrect reading. Check resistance scale and parameters.
M325	Saw bow descend restricted: please check	Check <i>blade descend clearance check</i> page for the cause.
M326	Guide arm position problem: move to left	Guide arm space is too small during swiveling the saw bow under manual mode. Activate guide arm automatic positioning function.
M327	Guide arm A/D abnormal	Resistance scale incorrect reading. Check resistance scale and parameters.
M328	Limit switch (mitering 45° ) abnormal	Limit switch (mitering 45° ) is activated at angle >50° . Check if limit switch works.

Error Code	Error Description	Solution
M330	Time-out: front vise to position 1 (rear)	Check if front vise moves normally
M331	Time-out: front vise to position 2 (front)	Check if front vise moves normally
M332	Time-out: front vise to position 3 (second to rear)	Check if front vise moves normally
M333	Time-out: front vise to position 4 (second to front)	Check if front vise moves normally
M334	PLC battery low voltage	The battery will soon be out of battery. It is critical to replace the battery, otherwise all programs and system parameters will be lost and the machine will not be able to function. Follow the below steps to replace battery.
M335	Guide arm not synchronized: please activate	Activate guide arm automatic positioning function.
M336	Front vise not synchronized: please activate	Activate front vise automatic positioning function
M337	Servo motor: zero return procedure required	Require servo motor zero return procedure after restarting the machine
M338	Down Feed Deviation Excessive	1. Calibrate down feed parameters 2. Enlarge deviation tolerance
M339	Start JOB > End JOB	Set Start JOB < End JOB
M340	Zero return procedure being executed	Servo motor zero return procedure being executed
M341	Current step set incorrectly	Set valid current step
M342	Calculation formula set incorrectly	Set valid calculation formula
M343	Timeout: zero return procedure	Servo motor return procedure time out. Check if rear vises move
M344	Left safety fence door abnormal	Check left safety fence door
M345	Right safety fence door abnormal	Check right safety fence door
M346	Front vise not clamping material	Clamp front vise to start the blade
M347	Find Edge length is too short	Material head is too close to the rear vise (<400mm)
M348	Find Edge length is too long	Material head is too far from the rear vise (<1000mm)
M351	Rear vise not clamping material	Clamp rear vise to start the blade

Error Code	Error Description	Solution
M352	Front vise clamping abnormal	1. Place new material 2. Check if the vise queen valve works 3. Check if the "no material parameter" is too low
M353	Rear vise clamping abnormal	Check if the vise queen valve works
M354	Shuttle vise forward-feed abnormal	Shuttle vise forward-feed time out. Check if shuttle vise move forward normally.
M355	Shuttle vise reverse-feed abnormal	Shuttle vise reverse-feed time out. Check if shuttle vise move backward normally.
M356	Saw blade slipping	Saw blade broken or slipping
M357	Saw bow descend abnormal	1. Check if the descend solenoid valve is stuck 2. Check the quick approach bar works 3. Check if the quick approach bar limit switch works
M358	Saw bow ascend abnormal	1. Check if the ascend solenoid valve is stuck 2. Check the quick approach bar works 3. Check the quick approach bar limit switch works
M361	No material	1. Place new material 2. Check if the vise queen valve works 3. Check if the "no material parameter" is too low
M362	Hydraulics stopped due to last cut function	Hydraulic system automatically stop due to last cut function
M363	Deviation detector abnormal	Blade deviates beyond the preset range
M364	Current abnormal	Blade motor current beyond the preset range
M365	Time-out: guide arm positioning	Check if guide arm move normally
M366	Blade descend prohibited due to guide arm protection	Prevent guide arm from hitting the bed, prohibit the saw bow move down
M367	Current Job Angle $\neq 90^\circ$	Current job angle is not $90^\circ$ , unable to cut
M368	Current Step Angle $\neq 90^\circ$	Current step angle is not $90^\circ$ , unable to cut
M369	Blade Angle $\neq 90^\circ$	Current blade angle is not $90^\circ$ , unable to cut
M370	Rotary Encoder Abnormal	Check rotary encoder
M371	zero return procedure required	Require Home action after restarting the machine
M372	Zero return procedure being executed	Zero return procedure being executed
M373	Auto Swivel procedure being executed	Auto Swivel procedure being executed
M374	Front and rear vises not clamping, unable to cut	Both front and rear vises not clamping, unable to cut

## REPLACING PLC BATTERY

Before replacing the battery

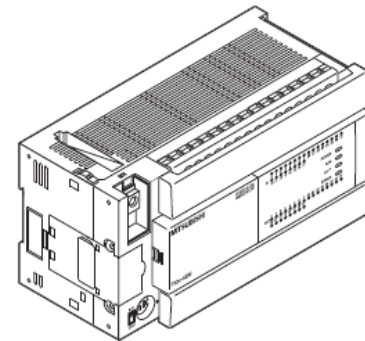
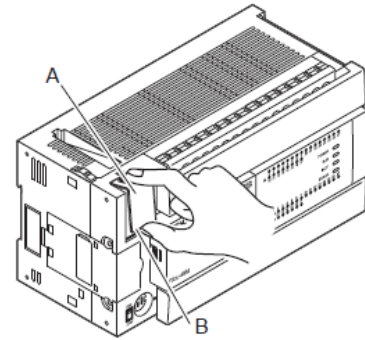
Step 4 of the replacement procedure (below), must be performed within 20 seconds after step 3, or the memory content could be lost.

**1** Turn the power OFF.

**2** Remove the battery cover.

Slightly lift the "B" side of the battery cover ("A").

Grasp the cover ("A") between your fingers and remove it.

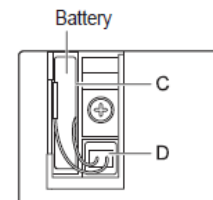


**3** Remove the old battery.

Extract the old battery from the battery holder ("C"), and disconnect the battery connector ("D").

**4** Install the new battery.

Connect the battery connector ("D") to the new battery, and insert the battery into the battery holder ("C").





**5** Attach the battery cover ("A").

## STANDARD ACCESSORIES

### Blade tension device

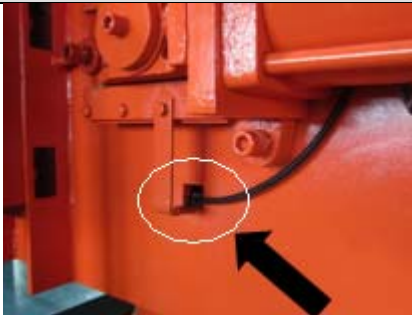


- This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.
- To tighten the saw blade, turn the selector to .
- Upon saw blade breakage, the safety device will activate and automatically stop all machine operation.
- To change the blade, turn the handle to  to release saw blade tension.



Never adjust blade tension while the blade is running.

### Blade speed/motion detector



- Besides detecting the blade speed, the speed/motion detector also functions as a safety device.
- The speed/motion detector protects operators and the machine by preventing blade overloads and consequent damages if a saw blade breaks or skids.
- Once blade breakage or slippage is detected, the drive wheel will stop in 10 seconds.

### Inverter



This inverter is installed inside the machine base. It is used to control and stabilize the saw blade speed during cutting.

To adjust blade speed, use the *blade speed control* knob on the control panel.



Voltage used should not exceed AC 460V.



**Note:**

1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.

## Gear reducer



The specially designed gear reducer can work toward your preset blade speed and torque.



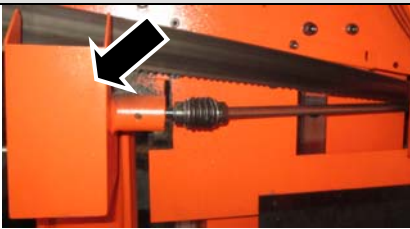
Please refer to Chapter 8 for information on maintenance.

## Coolant Pump



The coolant pump supplies coolant to cool off cutting temperatures during cutting. Also, it can be used to wash off chips.

## Wire Brush



The wire brush is hydraulically driven to rotate at the same speed as the blade motor. It removes the metal chips on the saw blade teeth so that blade life can be extended.



Keep hands away from the transmission shaft and the brush while the wire brush is running.



Turn off the hydraulic motor or the main power switch before performing maintenance or cleaning on the wire brush drive system.

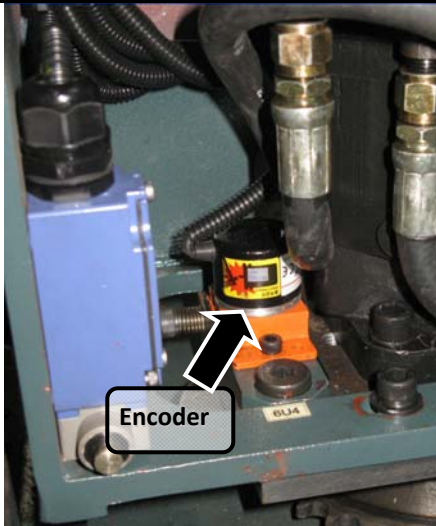
## Hydraulic top clamp device



- The device is installed on the saw bow.
- The top clamp will hold the material tightly so as to avoid material sliding during cutting.
- Use the adjustment valve to adjust its speed during clamping/unclamping.
- When the vise moves, the top clamp will act in synchronization.



## Mitering Angle Encoder



Located inside the pivot base, the mitering angle encoder comes into work as the operator executes hydraulic mitering by giving a precise angle reading.



The encoder is a high-precision electronic device. It has been factory-adjusted before shipment. Please do not make any random change to it.



Avoid high impact on the device.



The return-to-zero point is set at 45°.

## Vibration Damper



Vibration damper roller is installed on the left saw arm. It reduces the high frequency noise while cutting large work piece.

## OPTIONAL ACCESSORIES

### Vise Pressure Regulator



- This adjustment valve is used to control vise pressure.
- Adjust vise pressure based on the material of your workpiece.
- When cutting pipes or soft materials, reduce vise pressure to prevent exerted pressure from damaging the workpiece shape or exterior.



Do not adjust vise pressure at any time during cutting.



Vise pressure should never be lower than 8 kg/cm<sup>2</sup>.



## Chip conveyor



Chip conveyor is a spiral device to bring chips out during cutting. When the hydraulic system is turned on, the user can adjust the conveying speed via the pressure valve.



As a regular maintenance, remove the chip conveyor and clean all chip deposits inside.

## Projection Light



Activate the switch to project a beam of light on the work piece. The operator can use the light as reference to adjust the cutting dimension of the work piece. The light will shut off automatically within 90 seconds.

## Warning Light



Warning light indicates below messages :

1. Red light: any abnormal situation
2. Yellow light: Hydraulic motor is on, blade is not running and no abnormal situation
3. Green light: Blade motor is on (blade is running) and no abnormal situation
4. Flash green light: Cutting completes and no abnormal situation

## 2M Roller Table



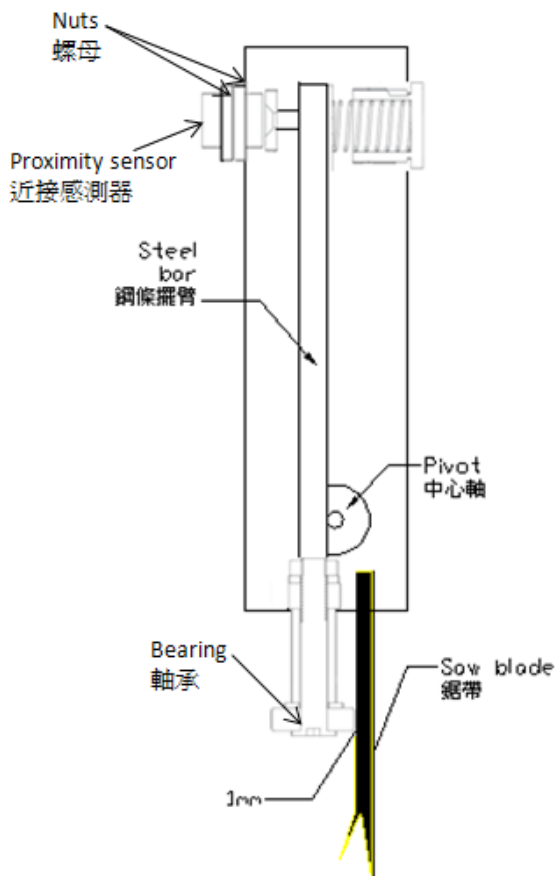
- The optional 2M roller table supports the work material and ensures the material is fed in smoothly.

## Blade Deviation Detector



This device detects blade deviation. If the blade deviates beyond the preset range, the machine will stop automatically. When this device is installed, the cutting width will be reduced. The blade deviation detected value and preset values are displayed on the control panel screen.

## Deviation Detector Calibration Procedure



### How to Adjust

1. Unclamp the tungsten carbide inserts.
2. Loosen the nuts.
3. Adjust the nuts until the blade deviation value shown the display returns to zero.
4. Tighten the nuts.
5. Clamp the tungsten carbide inserts.

### How to Check

1. When the carbide inserts are relieved, the distance between the saw blade and the proximity sensor set should be about **4 mm**.
2. When the carbide inserts are clamped, the distance between the saw blade and the proximity sensor set should be about **1 mm**.

Adjust the nuts so that when the steel bar touches the proximity sensor, the blade deviation displayed on the control panel is zero.



Make sure the saw blade is set up square at 90° right angle.

## Blade protection device



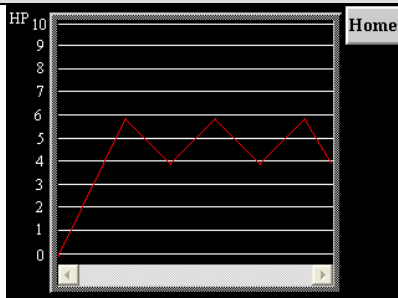
- This device is for blade protection.
- When electric current value is greater than default setting value, saw bow automatically rises to avoid blade damage.

## Spray device







- This device is for cutting aluminum.
- Spray on blade during cutting period.
- Easy to control and clean the chips on the blade.

## V-Drive



- It increases cutting efficiency and reduces vibration.

## MANUAL CUTTING

Step	Action
1	Switch to setting mode  . HMI auto/single loop mode will automatically select single loop mode  .
2	If auto swivel function if needed, switch to cutting mode  first then swivel the saw bow to mitering angle.
3	Open front and rear vises and place material.
4	Clamp rear vises until rear clamping vise icon turns solid white.
5	Turn on the <i>front vise automatic positioning function</i> .
6	Clamp front vises until front clamping vise icon turns solid white.
7	Turn on the guide arm automatic positioning function.
8	Descend the saw bow just above the material. No quick approach device function under manual (single loop) mode.
9	Switch to cutting mode  .
10	Press the saw blade start/stop buttons and start the blade.

# AUTOMATIC CUTTING

Step	Action	Reference
1	Position material (refer to above manual cutting) <div data-bbox="300 353 798 660" style="text-align: center;"> <p>The diagram illustrates the setup for automatic cutting. It shows a rectangular piece of material with two parallel diagonal cuts. The first cut is highlighted in yellow and the second in green. Both cuts are labeled 'Step 1'. An arrow points to a red dot at the bottom-left corner of the material, labeled 'Alignment point'. Below the material, two horizontal dimension lines indicate the length of each cut, both labeled 'L1'.</p> </div>	Make full use of <i>shuttle vise forward/backward</i> buttons to position the material where the first cut needs to be.
2	Clamp both front and rear vises (refer to above manual cutting)	<i>Front vise clamp / rear vise clamp</i> buttons.
3	Raise the saw bow to be at the upper limit position	<i>Saw bow up</i> button
4	Switch to AUTO mode.	
5	Program cutting job <ul style="list-style-type: none"> <li>a. Make sure all required information including step number, blade speed, downfeed speed, length, angle, step end no., and product quantity in <i>Effective Job Work Zone</i> has been filled out correctly.</li> <li>b. Make sure the <i>product count formula</i> is selected correctly.</li> <li>c. Reset old <i>completed step</i> data and <i>finish quantity</i> data if this is a new cutting job. If restarting an old job from the middle, select the corresponding "<i>current step</i>" to start cutting with.</li> </ul>	<i>Effective Job Work Zone</i> <i>Standby Job Work Zone</i> <i>Job Database</i>
6	Start the blade.	<i>Saw blade start</i> button
7	The blade will start running and descending. Once the blade cuts into the material, adjust the blade speed and downfeed speed if necessary.	If change to blade speed and downfeed speed is necessary, remember to change <i>Effective Cutting Job</i> to make change official for next execution.

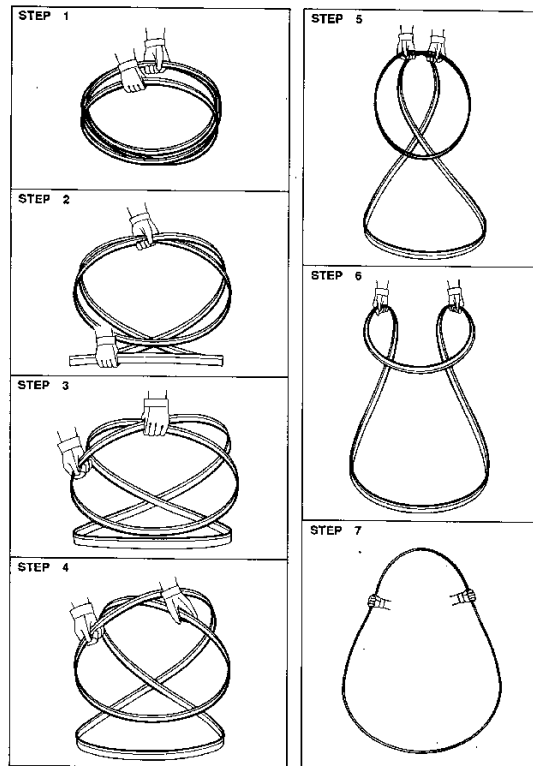
## UNROLLING & INSTALLING THE BLADE



Always wear leather gloves and protection glasses when handling a blade.

### Unrolling the blade

Please follow the procedures illustrated below.





### Installing a new blade

Step 1 - Select the most suitable saw blade for your workpiece considering the size, shape and material.

Step 2 - Turn on the machine power by switching to *ON* and turn on the hydraulic system.

Step 3 - Switch to *setting* mode.

Step 4 - Press the *saw bow up* button and elevate the saw bow to the proper position.

Step 5 - Turn the tension controller handle from “” to “” position to release tension. The idle wheel will then move slightly toward the direction of the drive wheel.




Step 6 - Open the idle and drive wheel cover.

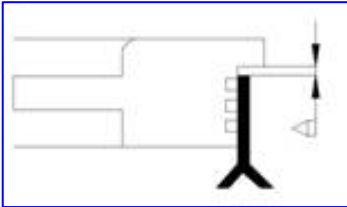
Step 7 - Open the wire brush cover. Loosen the screws and move the wire brush away from the blade.

Step 8 - Detach the old blade from below the left and right guide seat and then pull the entire blade out.

Step 9 - Place the new blade around the idle wheel and the drive wheel

Step 10 - Insert the blade into the left and right tungsten carbide inserts. The back and the sides of the blade need to be touching the inserts as well as the adjacent rollers.

Step 11 - Place the blade to the drive wheel and press the back of the blade against the flange of the idle/drive wheel. Turn the tension controller handle to [  ] position to obtain blade tension.



Step 12 - Adjust wire brush to a proper position and tighten the screws.

Step 13 – Gently close the idle and drive wheel covers.

## ADJUSTING WIRE BRUSH

Follow these steps to adjust wire brush to appropriate position:

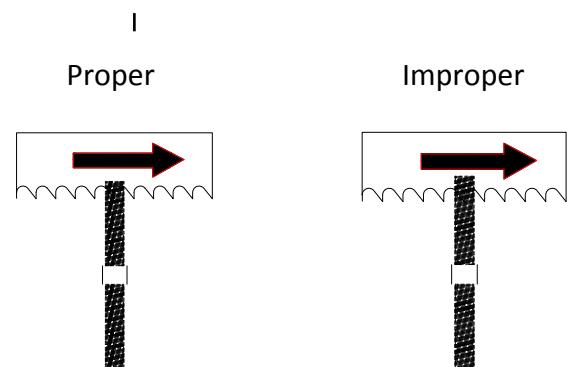
Step 1 – Open the wire brush cover.

Step 2 – Loosen the screws.

Step 3 – Make brush move up / down until it makes proper contact with the saw blade (see below illustration).

Step 4 – Tighten the screws.

Step 5 – Close the wire brush cover.



## ADJUSTING BLADE SPEED

Step 1 – Set the flow control to “0” position.

Step 2 – Press the *saw blade start* button to start the blade.

Step 3 – Turn the *blade speed control knob* to adjust the blade speed. The blade speed should be adjusted based on the size and the material of the workpiece.

## ADJUSTING COOLANT FLOW

Step 1 – Press the *saw blade start* button to start the saw blade drive motor.

Step 2 – Press the *saw bow down* button to lower the saw bow.

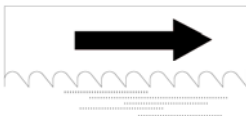
Step 3 – Use the flow control valve (shown below) to adjust the amount of fluid flowing to the cutting area.



Adjust the flow amount if you observe the following changes to the chips generated from cutting.



If the chips are sharp and curved, increase the coolant flow amount.



If the chips are granulated, decrease the coolant flow amount.

## BREAKING-IN THE BLADE

When a new saw blade is used, be sure to first break in the blade before using it for actual, extended operation. Failure to break in the blade will result in less than optimum efficiency. To perform this break-in operation, the following instructions should be followed:

Step 1 - Reduce the blade speed to one-half of its normal setting.

Step 2 - Lengthen the cutting time to 2-3 times of what is normally required.

Step 3 - The complete break-in operation requires cutting on a 645mm<sup>2</sup> (25.4in<sup>2</sup>) section for 5 times.

Step 4 - After the break-in operation is completed, set all parameters back to normal settings.

## TEST-RUNNING THE MACHINE

Test-running this machine can ensure good machine performance in the future. We suggest you run the following tests on the machine before first use:

### **Testing machine performance:**

Turn on the power and run a basic performance test after you finish installing the machine. Follow these steps to test machine performance:

Step 1 – Disassemble shipping brackets and bolts.

Step 2 – Install roller table (optional).

Step 3 – Turn on the relay switch in the control box.

Step 4 – Elevate the saw bow. (If your coolant pump is in reverse and the machine cannot run, please change the electrical phase.)

Step 5 – After the saw bow ascends, extend the quick approach device (optional).

Step 6 – Remove the rust-prevention grease with cleaning oil or kerosene.

Step 7 – Start the coolant pump.

Step 8 – Test these functions under manual mode:

- vise clamping/unclamping
- saw bow ascending/descending
- feeding forward and backward.



## TERMINATING A CUTTING OPERATION

- To terminate a cutting operation, press either the *saw bow up* button or the *emergency stop* button.
- The saw blade will stop running when the *saw bow up* button is pressed.
- Both the saw blade and hydraulic pump motors will stop running when the *emergency stop* button is pressed.
- The machine will stop automatically when an error occurs. The error message will be shown on the screen.



# *ELECTRICAL SYSTEM*

## **ELECTRICAL CIRCUIT DIAGRAMS**

### CE model

- Fig. 5-1 Main circuit diagram (CE)
- Fig. 5-2 EMO circuit diagram (CE)
- Fig. 5-3 Vise safety circuit diagram (CE)
- Fig. 5-4 110V circuit diagram (CE)
- Fig. 5-5 DC24V (CE)
- Fig. 5-6 Inverter layout (CE)
- Fig. 5-7 PLC IN1 layout (CE)
- Fig. 5-8 PLC IN2 layout (CE)
- Fig. 5-9 PLC IN3 layout (CE)
- Fig. 5-10 PLC IN4 layout (CE)
- Fig. 5-11 PLC OUT1 layout (CE)
- Fig. 5-12 PLC OUT2 layout (CE)
- Fig. 5-13 PLC OUT3 layout (CE)
- Fig. 5-14 PLC OUT4 layout (CE)
- Fig. 5-15 PLC OUT5 layout (CE)
- Fig. 5-16 PLC OUT6 layout (CE)
- Fig. 5-17 SERVO IO layout (CE)
- Fig. 5-18 PLC 4DA layout (CE)
- Fig. 5-19 PLC 1HC layout (CE)
- Fig. 5-20 PLC 8AD layout (CE)
- Fig. 5-21 PROPORTIONALVALVE AMPLIFIER (CE)
- Fig. 5-22 PLC layout (CE)
- Fig. 5-23 Control panel layout (CE)
- Fig. 5-24 Wiring diagram (CE)

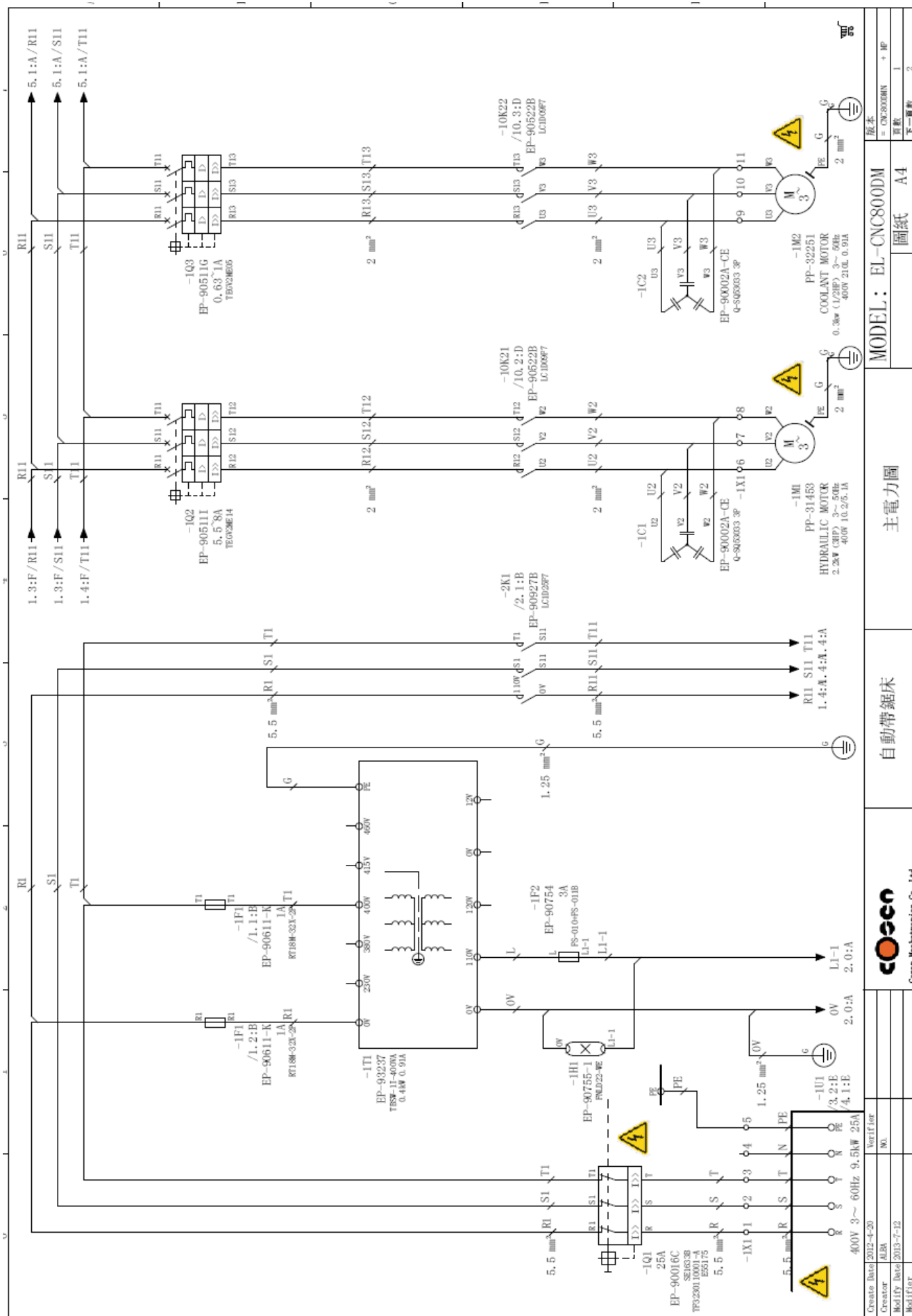


Fig. 5-1 Main circuit diagram (CE)

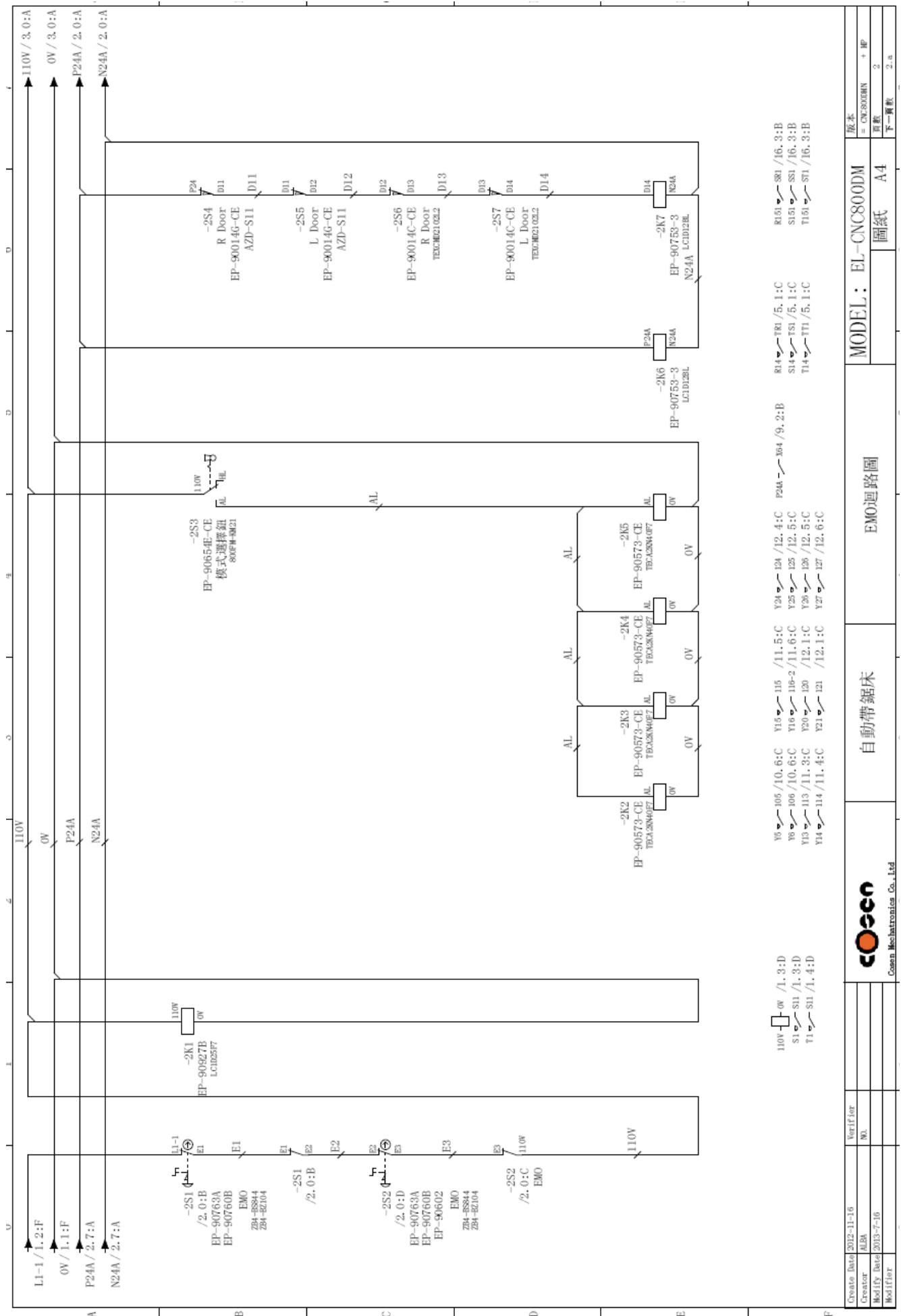


Fig. 5-2 EMO circuit diagram (CE)

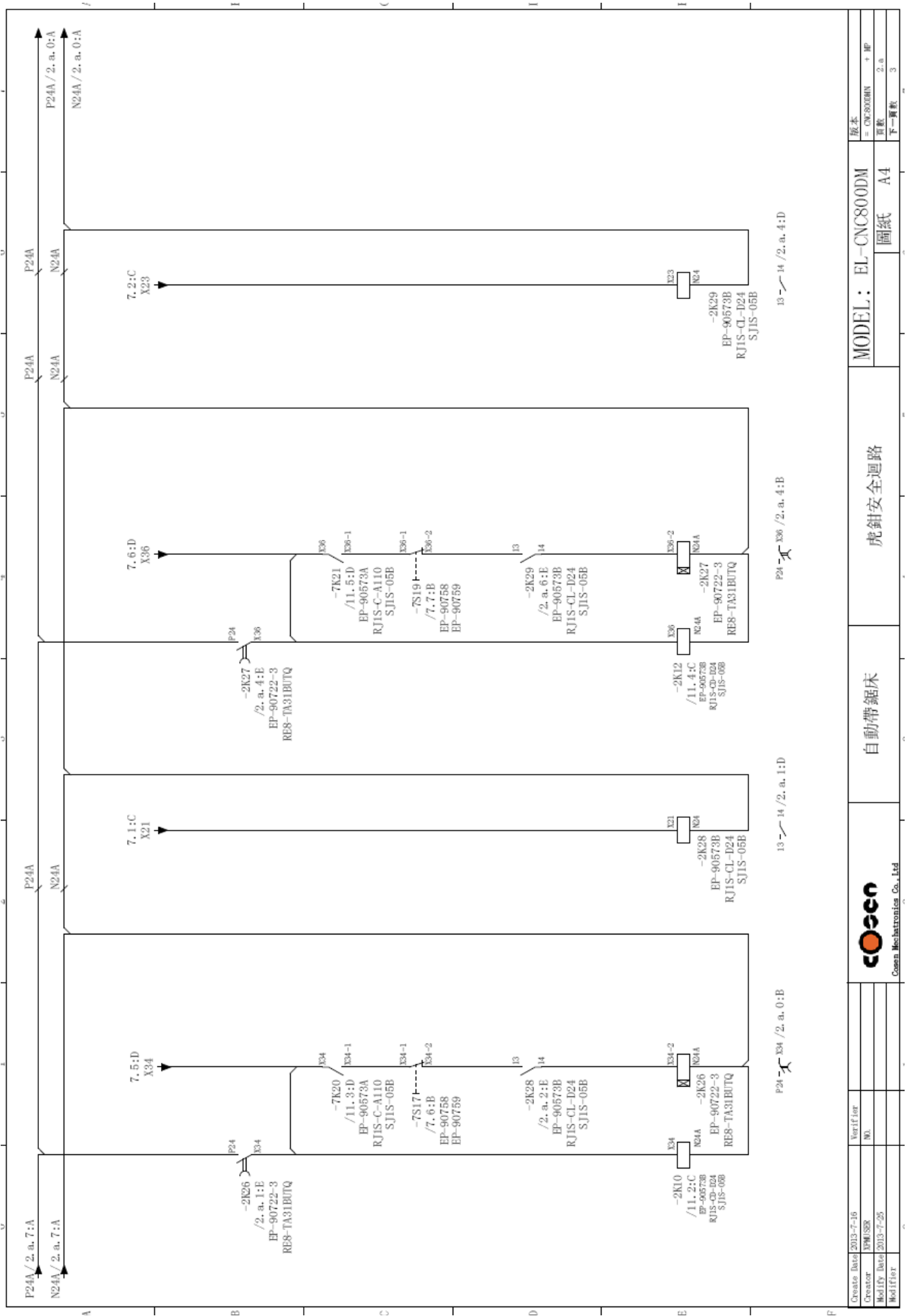


Fig. 5-3 Vise safety circuit diagram (CE)

Create Date 2013-7-16	Verifier	MODEL: EL-CNC800DM 圖紙 A4	版本 = CNC800DM + EP 頁數 2.a 下一頁數 3
Creator KPM/SBR	虎鉗安全迴路		
Modify Date 2013-7-25	自動帶鋸床		
Modifier			



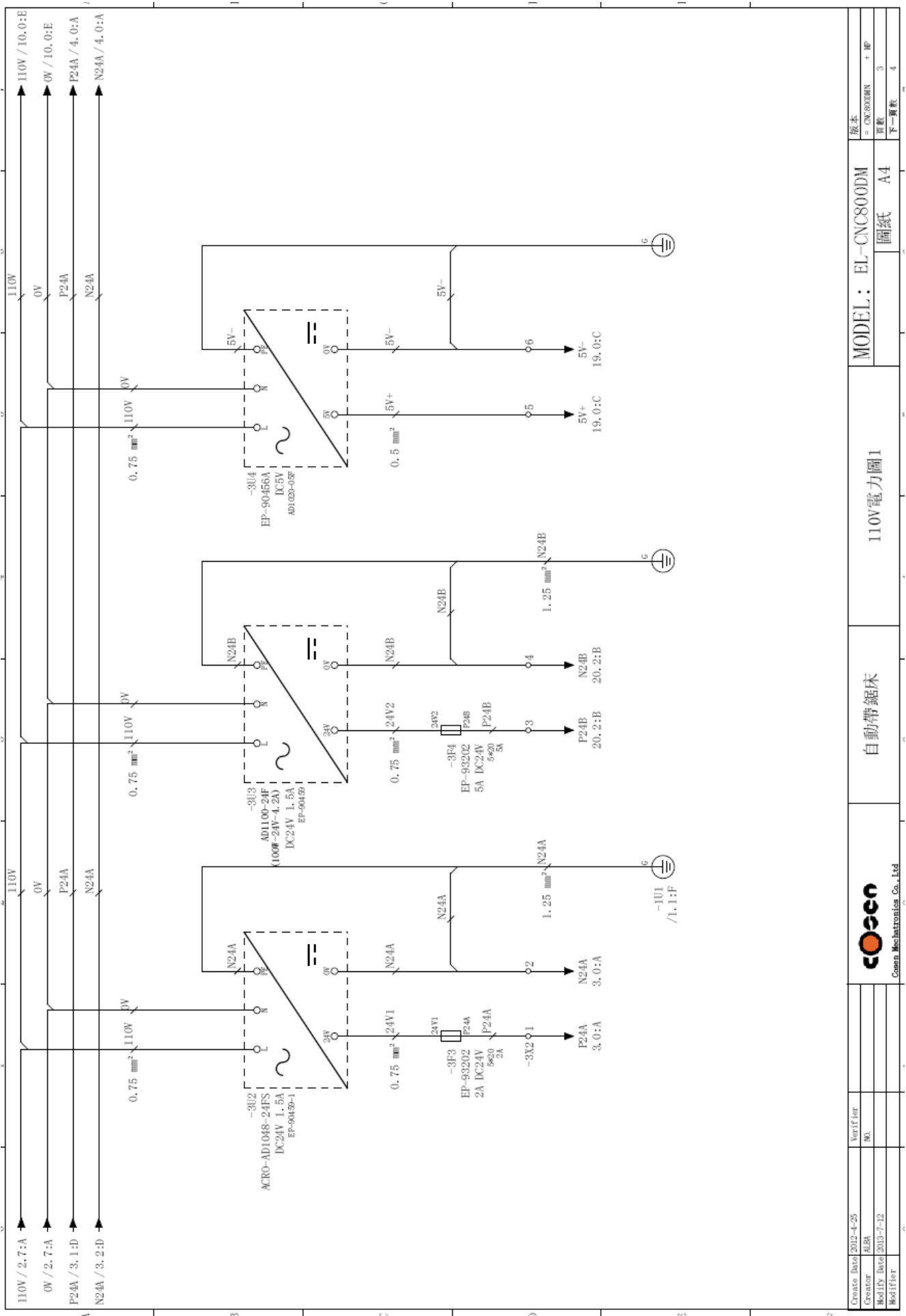


Fig. 5-4 110V circuit diagram (CE)

Create Date	2012-4-25	Verify for		MODEL: EL-CNC800DM 圖紙 A4	版本	EL-CNC800DM + MP
Creator	ALB	W.			頁數	3
Modify Date	2013-7-12				下一頁數	4
Modifier						
 Cosan Mechatronics Co., Ltd.			自動帶鋸床		110V電力圖1	

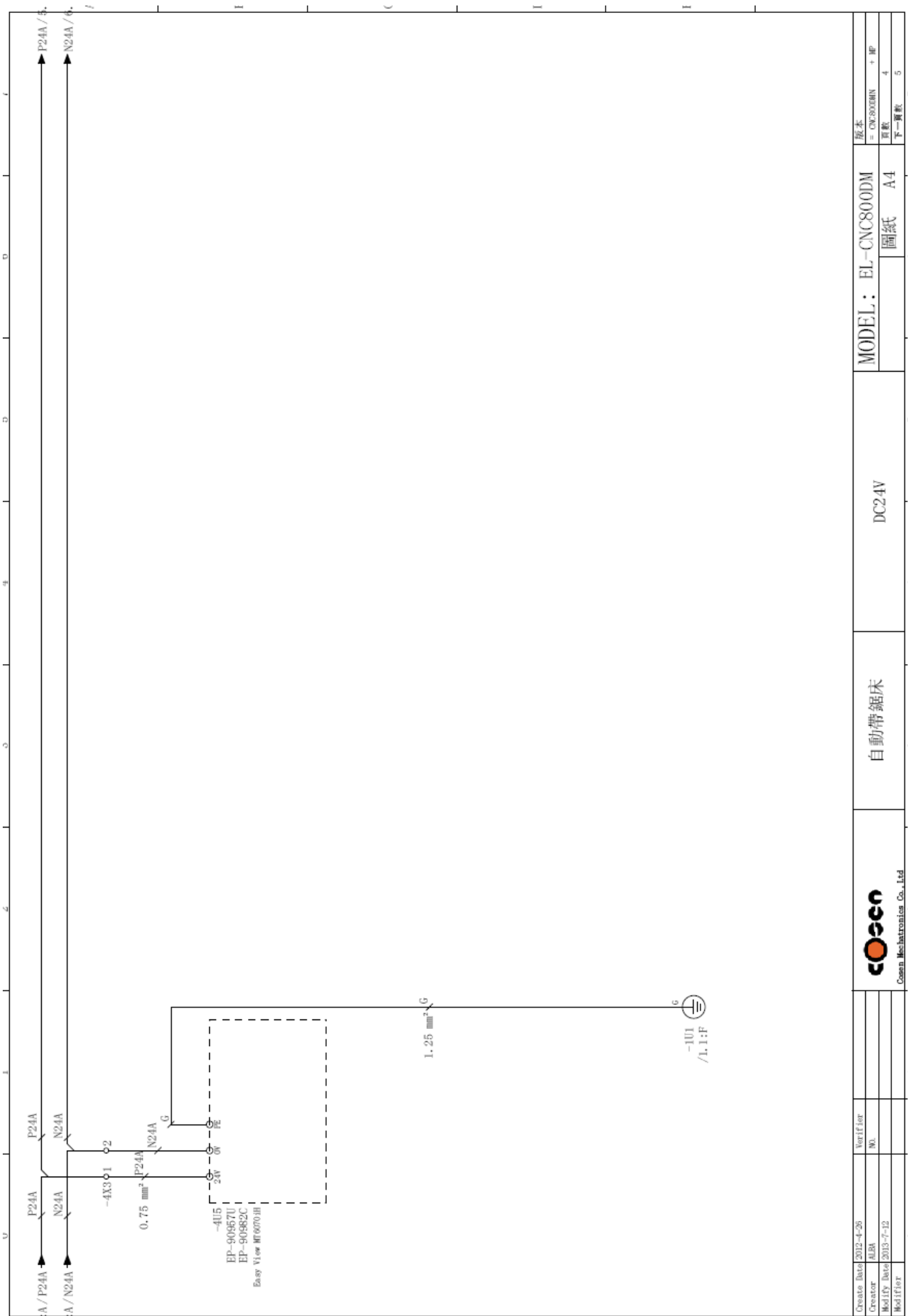



Fig. 5-5 DC24V (CE)

Create Date	2012-4-26	Verifier		MODEL : EL-CNC800DM 圖紙 A4	版本 = CNC800DM + HP
Creator	ALBA	ML			頁數
Modify Date	2013-7-12				4
Modifier					下一頁數
 Cosen Mechatronics Co., Ltd				自動帶鋸床	DC24V

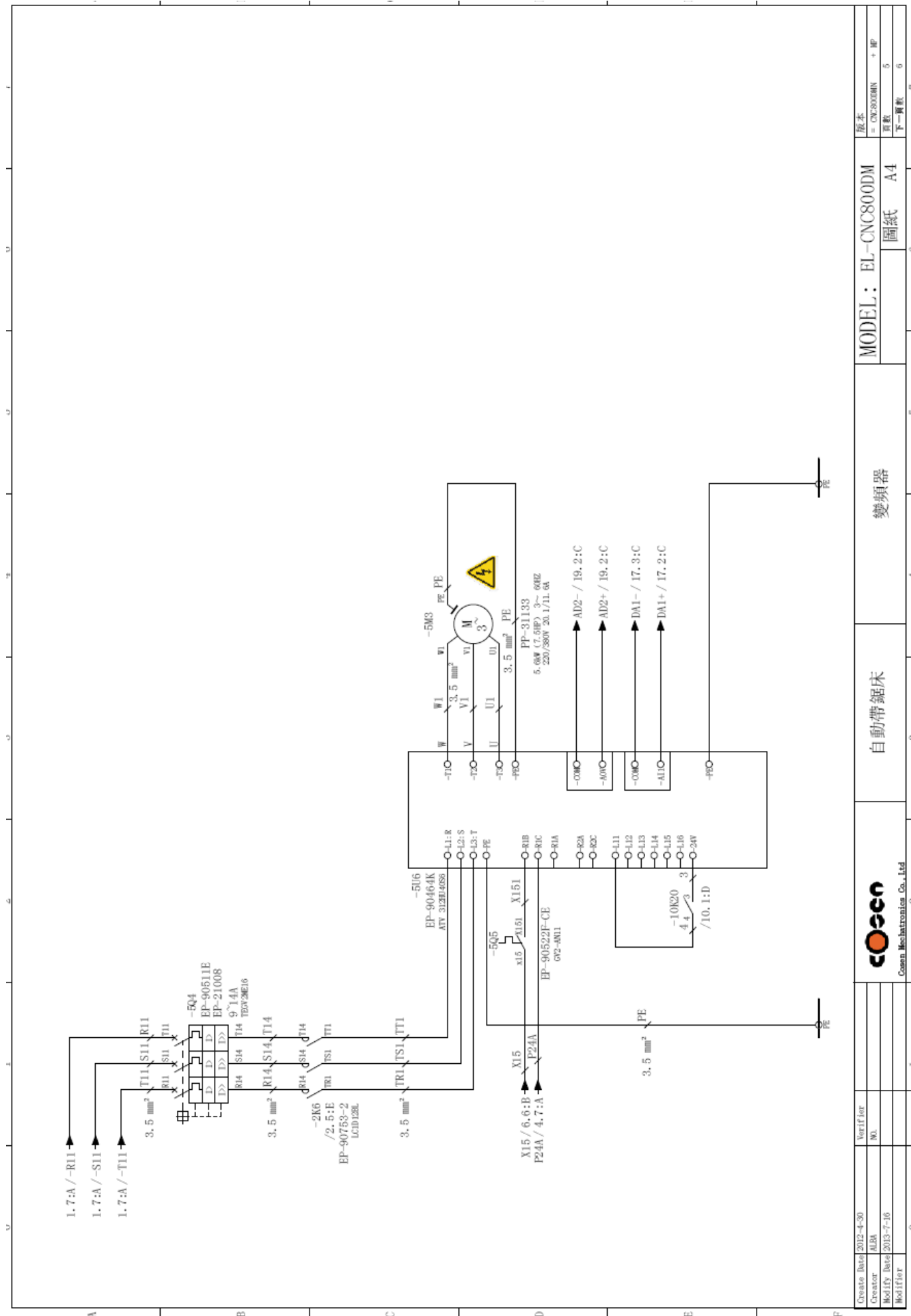


Fig. 5-6 Inverter layout (CE)

Create Date	2012-4-30	Verifier		MODEL: EL-CNC800DM 圖紙 A4	版本 = CNC800DM + MP 頁數 5 下一頁數 6
Creator	ALBA				
Modify Date	2013-7-16				
Modifier				自動帶鋸床	變頻器
		Cosen Mechatronics Co., Ltd.			

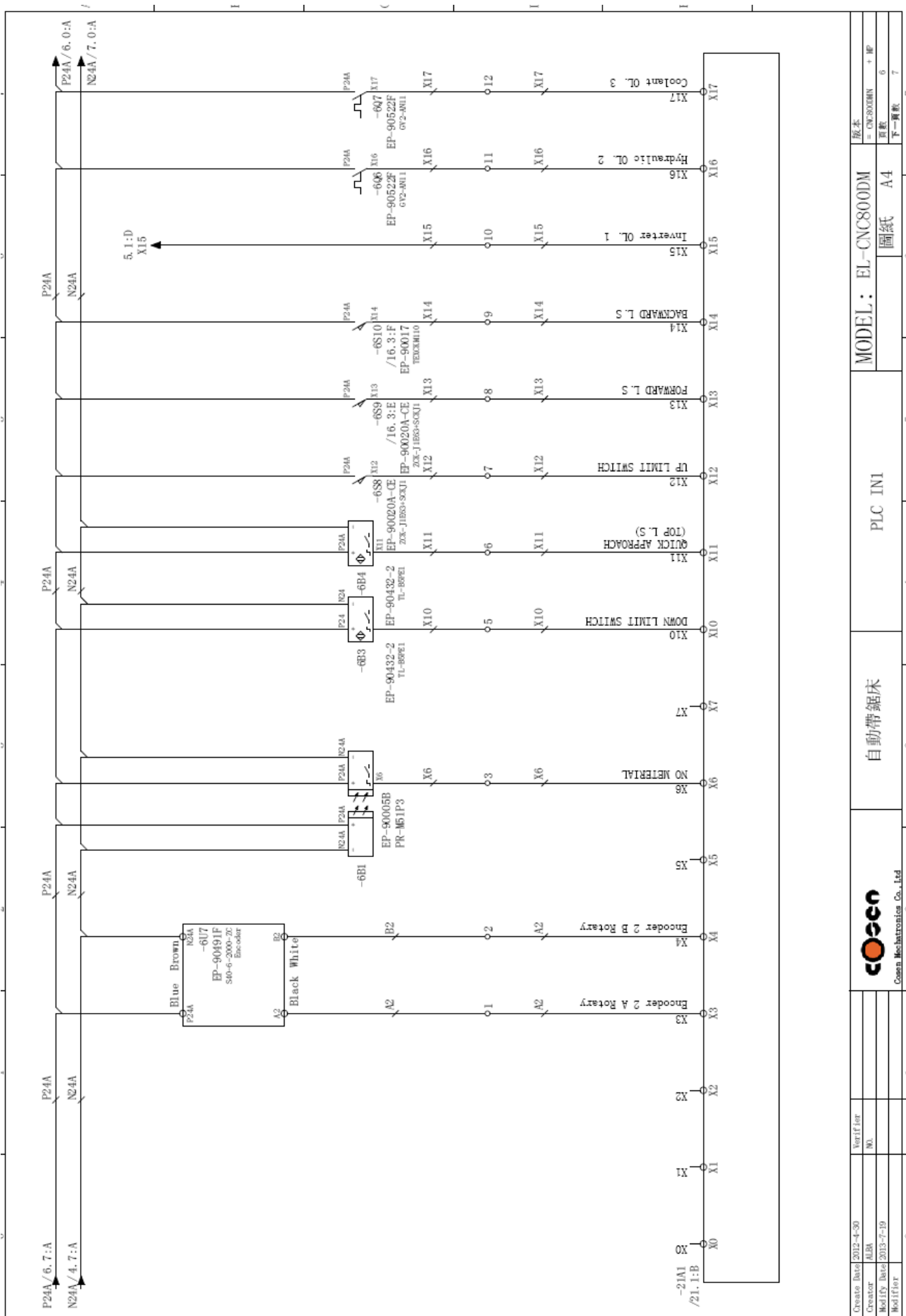


Fig. 5-7 PLC IN1 layout (CE)

Create Date	2012-4-30	Verifier	
Creator	ALBA	MA	
Modify Date	2013-7-19		
Modifier			
MODEL: EL-CNC800DM		圖紙 A4	
自動帶鋸床		PLC IN1	
Cosen		Cosen Mechatronics Co., Ltd	
版本 = CNC800DM + HP		頁數	0
		下一頁數	7



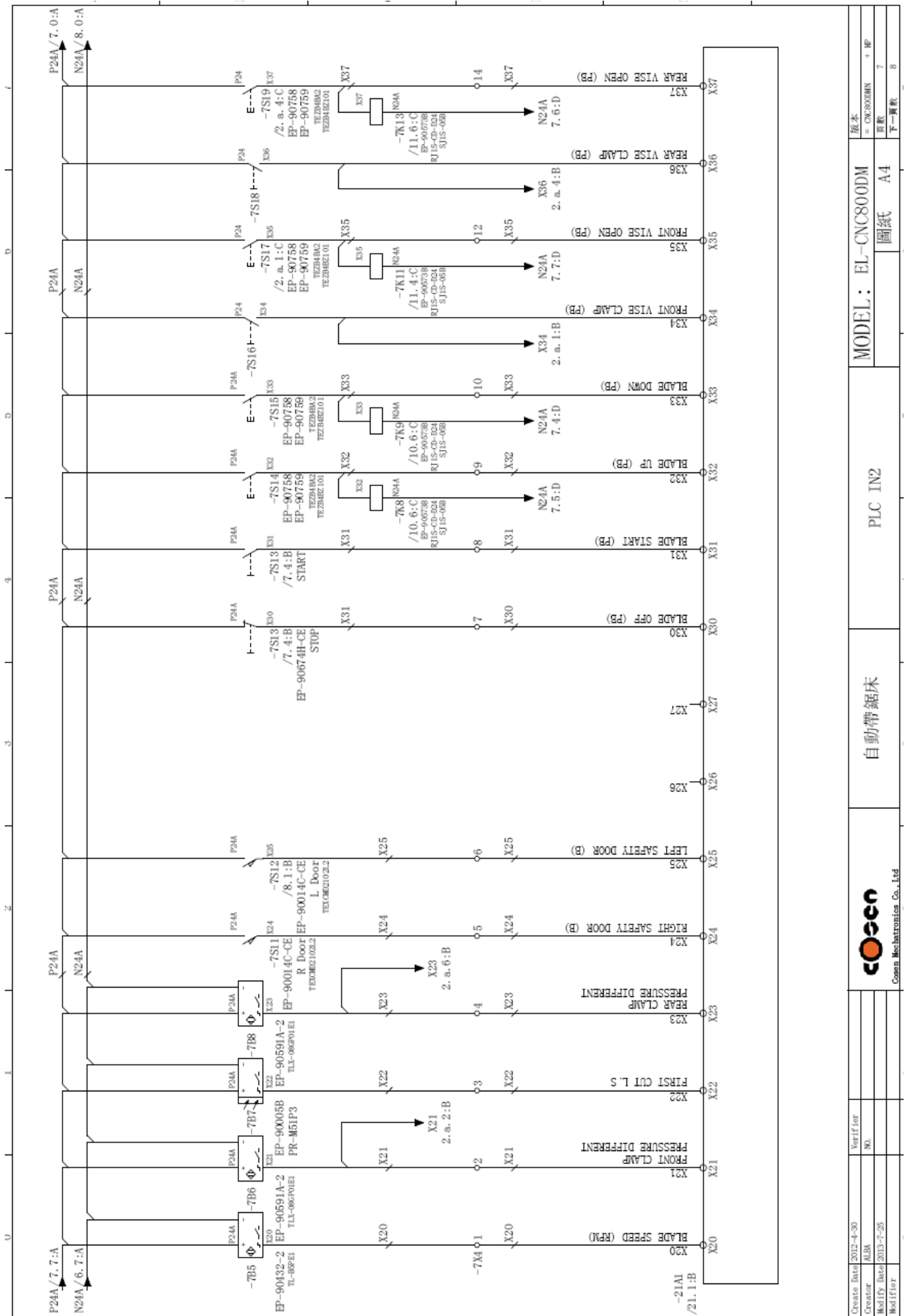


Fig. 5-8 PLC IN2 layout (CE)

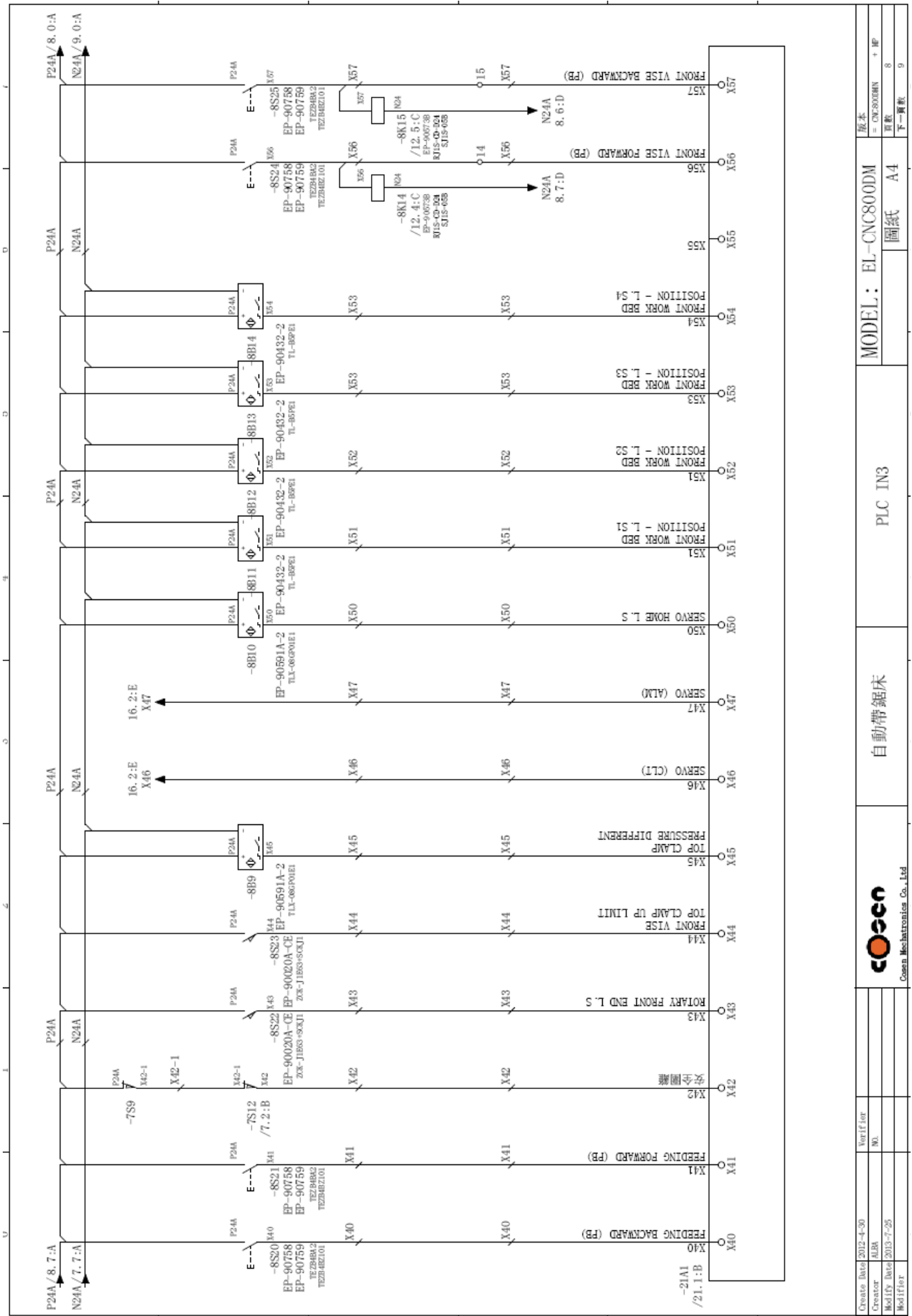


Fig. 5-9 PLC IN3 layout (CE)

Create Date: 2012-4-30 Creator: ALB Modify Date: 2013-7-25 Modifier:	Verify for: ML Model: EL-CNC800DM Model: 圖紙 A4 PLC IN3 自動帶鋸床 Cosin Mechatronics Co., Ltd.	版本: -CNC800DM + RP 頁數: 8 下一頁數: 9
-------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------	----------------------------------------

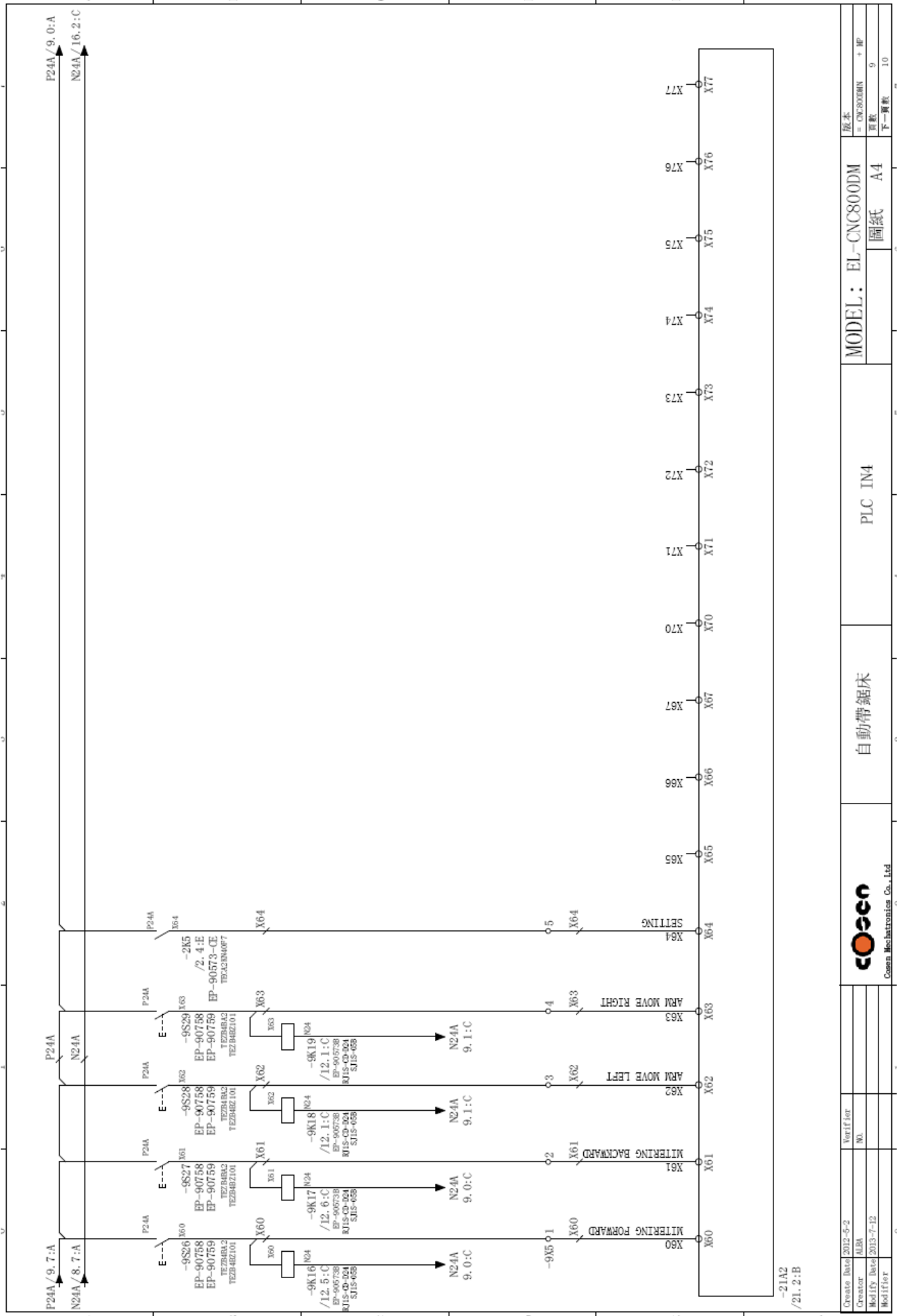
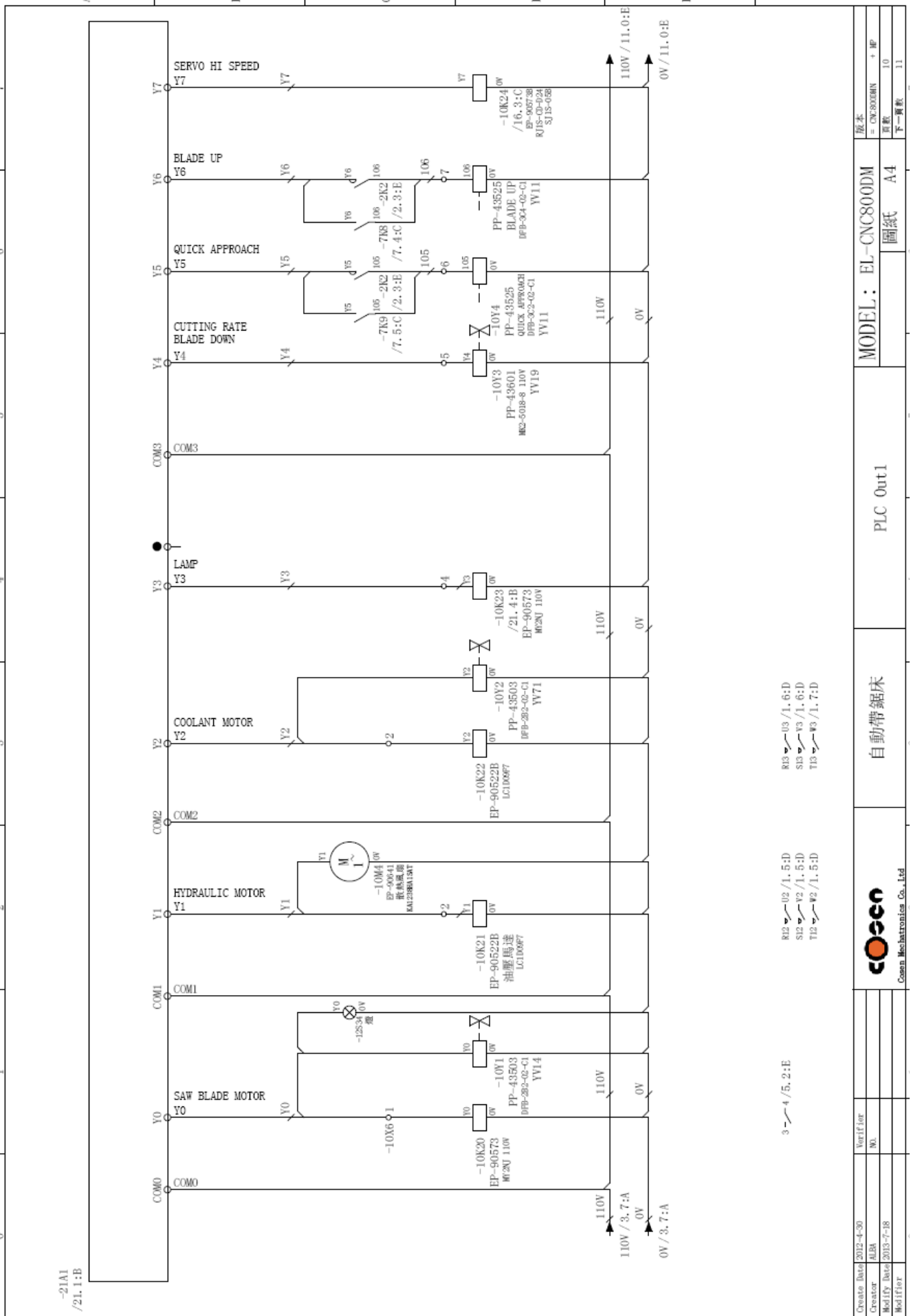


Fig. 5-10 PLC IN4 layout (CE)

<table border="1"> <tr> <td>Version</td> <td>9</td> <td>Version</td> <td>10</td> </tr> <tr> <td>Model</td> <td>CNC800DM</td> <td>Model</td> <td>CNC800DM</td> </tr> <tr> <td>Sheet</td> <td>9</td> <td>Sheet</td> <td>9</td> </tr> <tr> <td>Next Sheet</td> <td>10</td> <td>Next Sheet</td> <td>10</td> </tr> </table>	Version	9	Version	10	Model	CNC800DM	Model	CNC800DM	Sheet	9	Sheet	9	Next Sheet	10	Next Sheet	10	MODEL: EL-CNC800DM	PLC IN4	自動帶鋸床	 Cosin Mechatronics Co., Ltd.	<table border="1"> <tr> <td>Create Date</td> <td>2012-9-2</td> <td>Verifier</td> <td></td> </tr> <tr> <td>Creator</td> <td>ALBA</td> <td>Model</td> <td></td> </tr> <tr> <td>Modify Date</td> <td>2013-7-12</td> <td></td> <td></td> </tr> <tr> <td>Modifier</td> <td></td> <td></td> <td></td> </tr> </table>	Create Date	2012-9-2	Verifier		Creator	ALBA	Model		Modify Date	2013-7-12			Modifier			
Version	9	Version	10																																		
Model	CNC800DM	Model	CNC800DM																																		
Sheet	9	Sheet	9																																		
Next Sheet	10	Next Sheet	10																																		
Create Date	2012-9-2	Verifier																																			
Creator	ALBA	Model																																			
Modify Date	2013-7-12																																				
Modifier																																					



Create Date	2012-4-30	Verify for		<b>MODEL: EL-CNC800DM</b> 圖紙 A4	版本	+ MP
Creator	ALBA	By			= CNC800DM	10
Modify Date	2013-7-18				圖紙	下一頁數
Modifier						11
PLC Out1				自動帶鋸床	 Cosen Mechatronics Co., Ltd.	

Fig. 5-11 PLC OUT1 layout (CE)

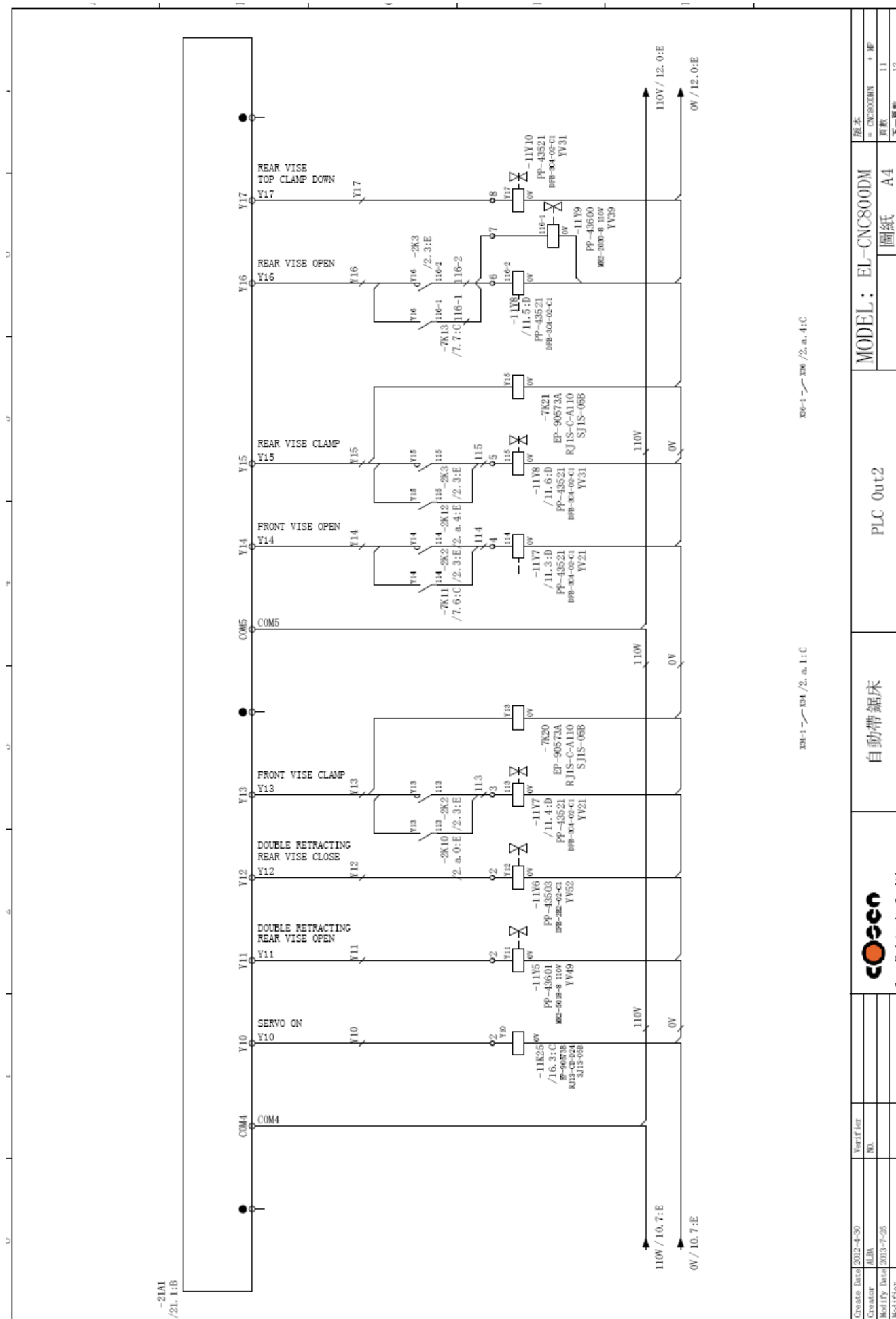


Fig. 5-12 PLC OUT2 layout (CE)

Create Date: 2012-4-30	Verifier:	MODEL: EL-CNC800DM	版本 = CN-800DM + MP
Creator: ALBA	No.:	圖紙 A4	頁數 11
Modify Date: 2013-7-25		自動帶鋸床	下一頁數 12
Modifier:		PLC Out2	
		Cosen Mechatronics Co., Ltd	

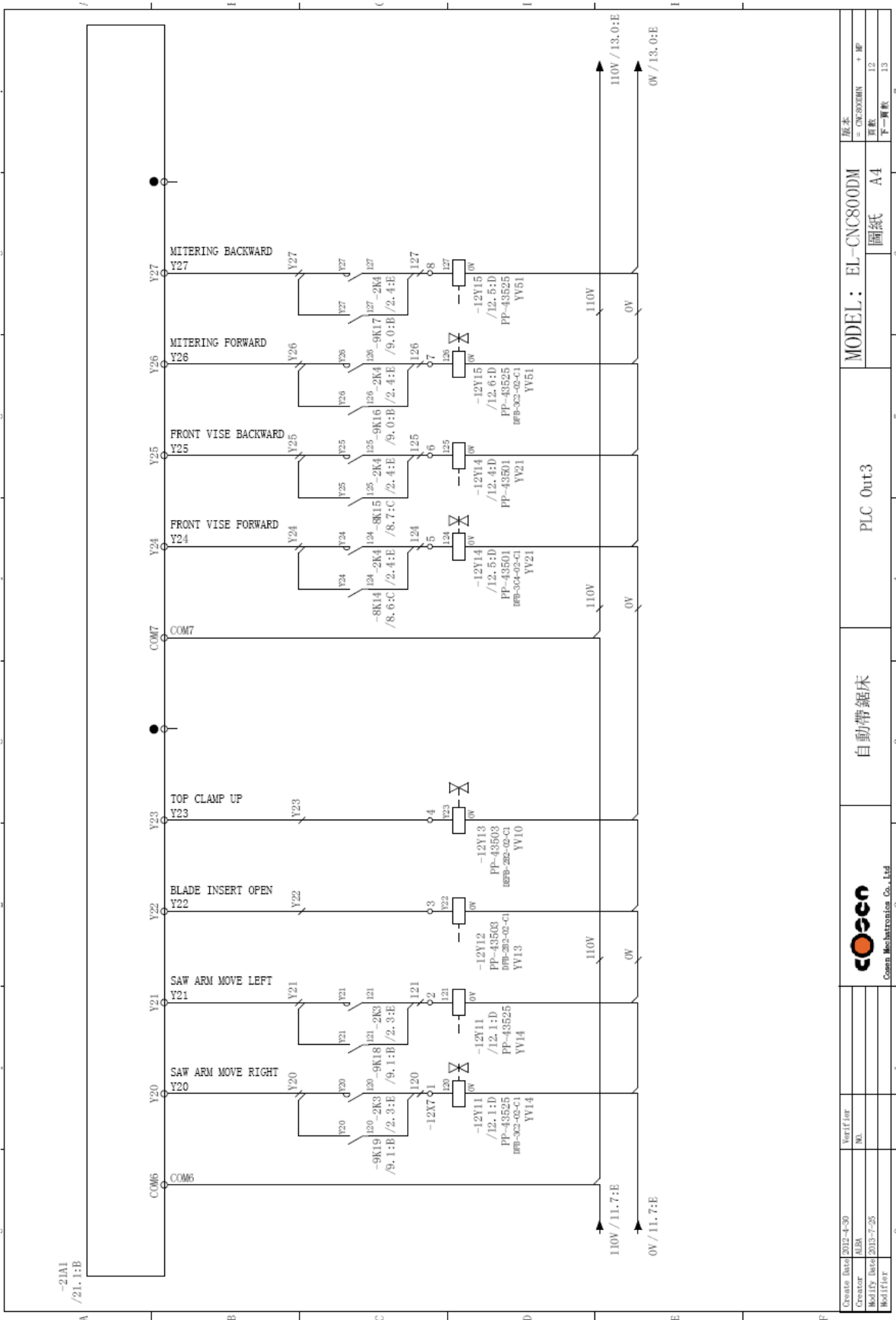


Fig. 5-13 PLC OUT3 layout (CE)

Create Date	2012-4-30	Verifier	
Creator	ALBA	Model	
Modify Date	2013-7-25		
Modifier			
 Cosen Mechatronics Co., Ltd.		自動帶鋸床	
MODEL: EL-CNC800DM		圖紙 A4	
PLC Out3		版本 = CN-800DM + BP 頁數 12 下一頁數 13	

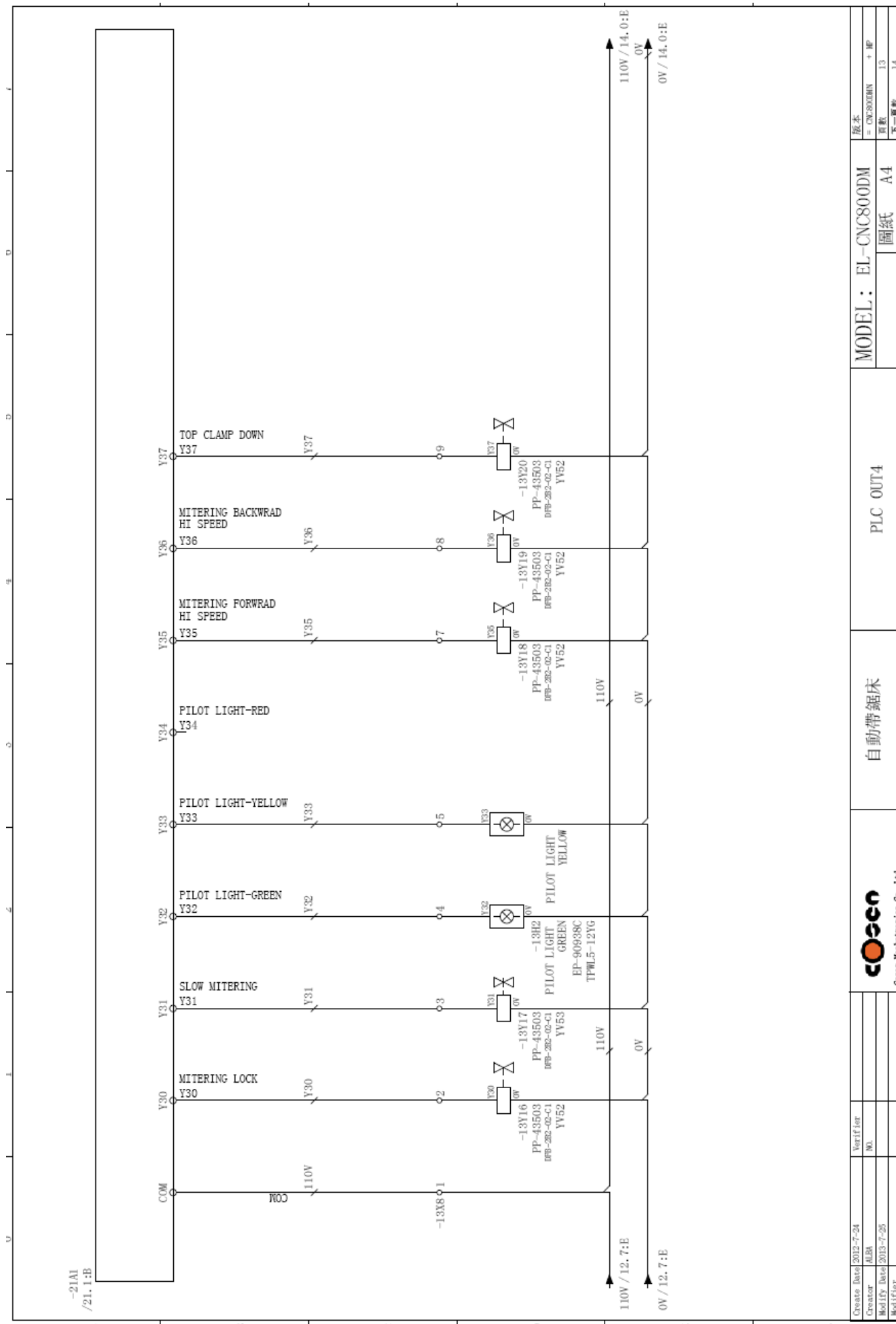


Fig. 5-14 PLC OUT4 layout (CE)

Create Date	2012-7-24	Verifier	
Creator	ALBA	NO.	
Modify Date	2013-7-25		
Modifier			
<b>cosen</b>		Cosen Mechatronics Co., Ltd	
自動帶鋸床		PLC OUT4	
MODEL: EL-CNC800DM		圖紙 A4	
版本	= CNC800DM	+ MP	
頁數	13		
下一頁數	14		

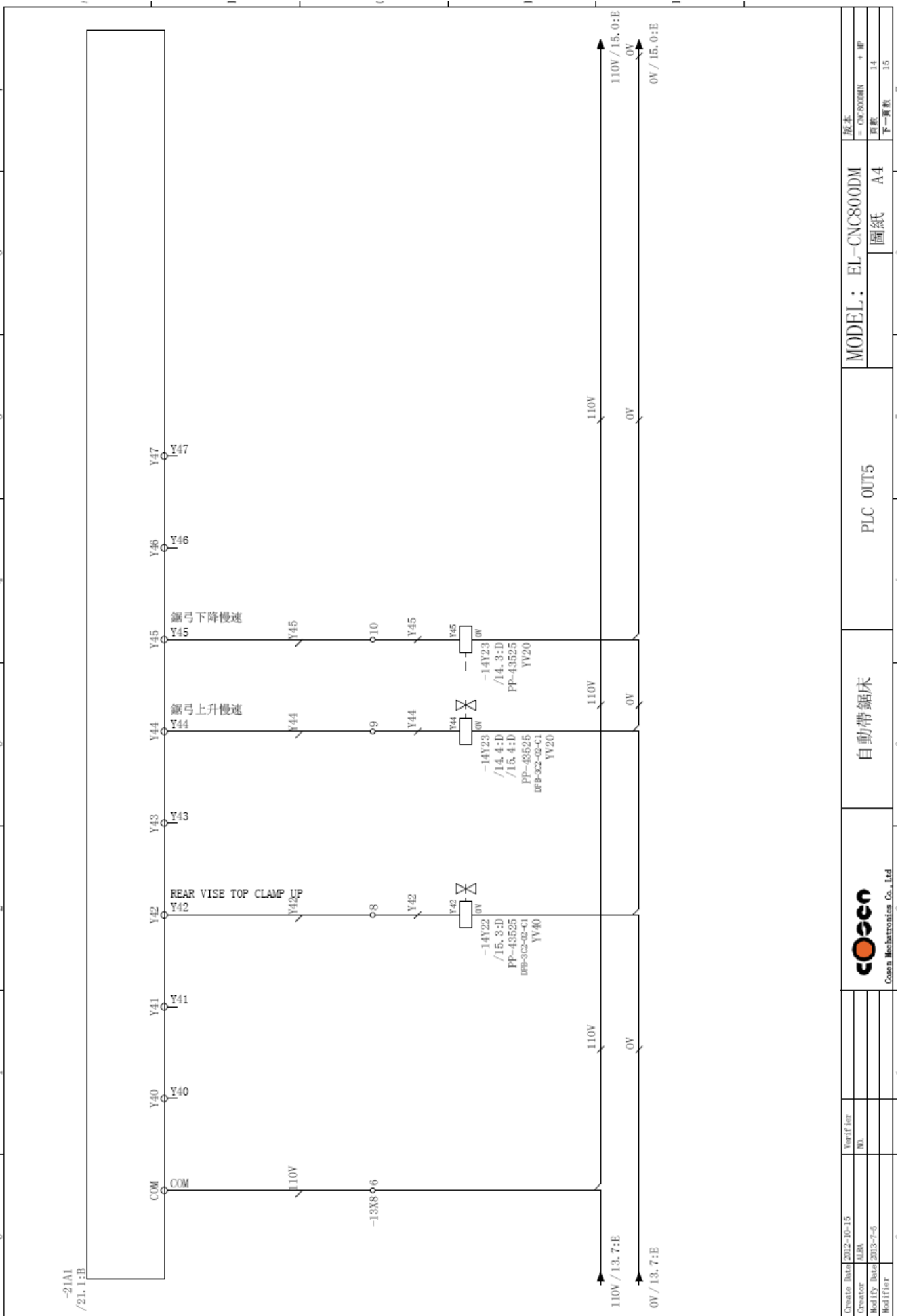



Fig. 5-15 PLC OUT5 layout (CE)

Create Date	2012-10-15	Verifier		MODEL: EL-CNC800DM 圖紙 A4	版本 = CNC800DM + MP 頁數 14 下一頁數 15
Creator	ALBA	NO.			
Modify Date	2013-7-5	Modifier			
 Cosen Mechatronics Co., Ltd.			自動帶鋸床		PLC OUT5



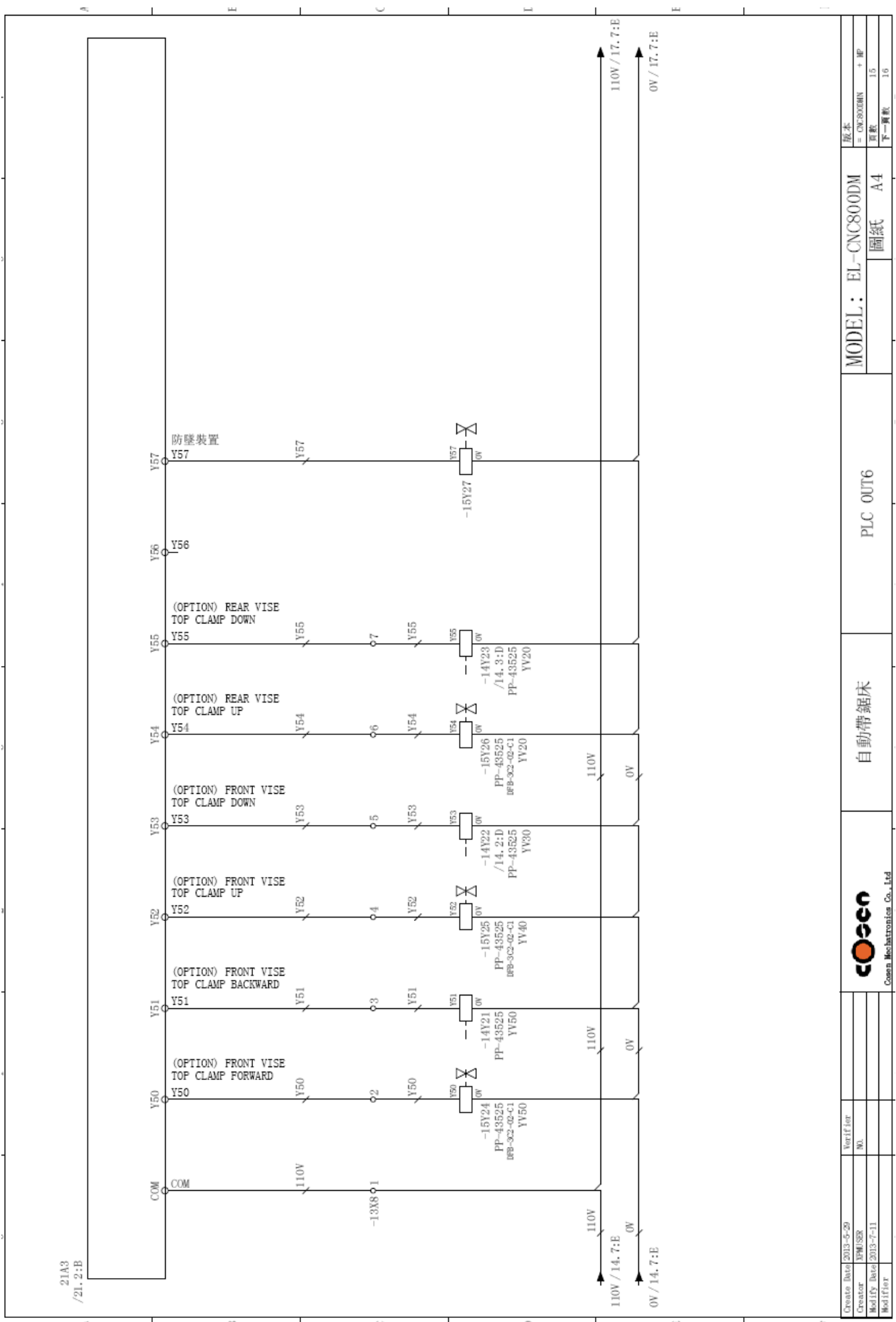


Fig. 5-16 PLC OUT6 layout (CE)

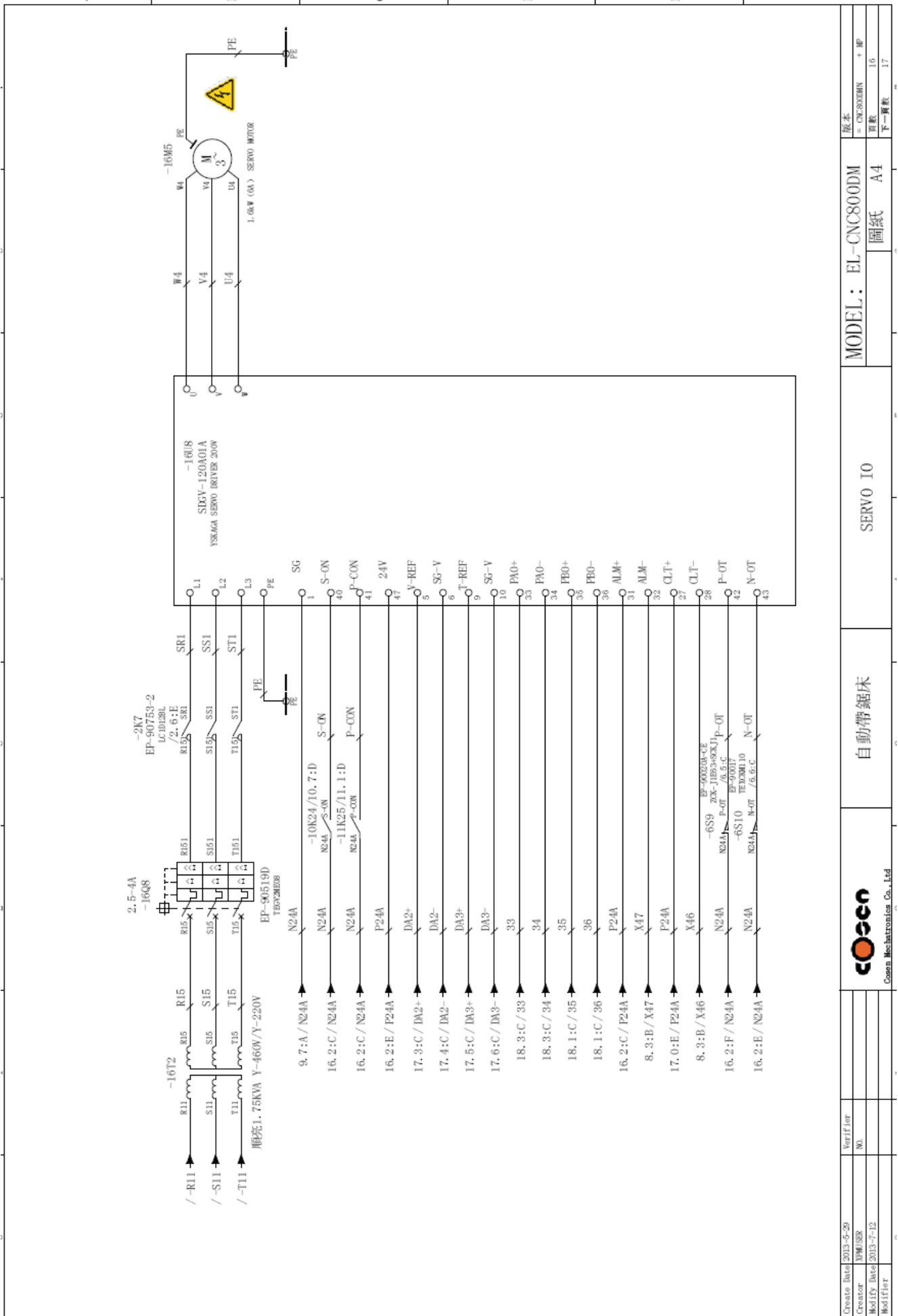


Fig. 5-17 SERVO IO layout (CE)

Create Date	2013-5-20	Verifier	
Creator	YPM/SBR	No.	
Modify Date	2013-7-12		
Modifier			
<b>COSEN</b> Cosin Mechatronics Co., Ltd		自動帶鋸床	
SERVO IO		MODEL: EL-CNC800DM	
		圖紙 A4	
		版本 = CNC800DM + MP	16
		頁數	17
		下一頁數	

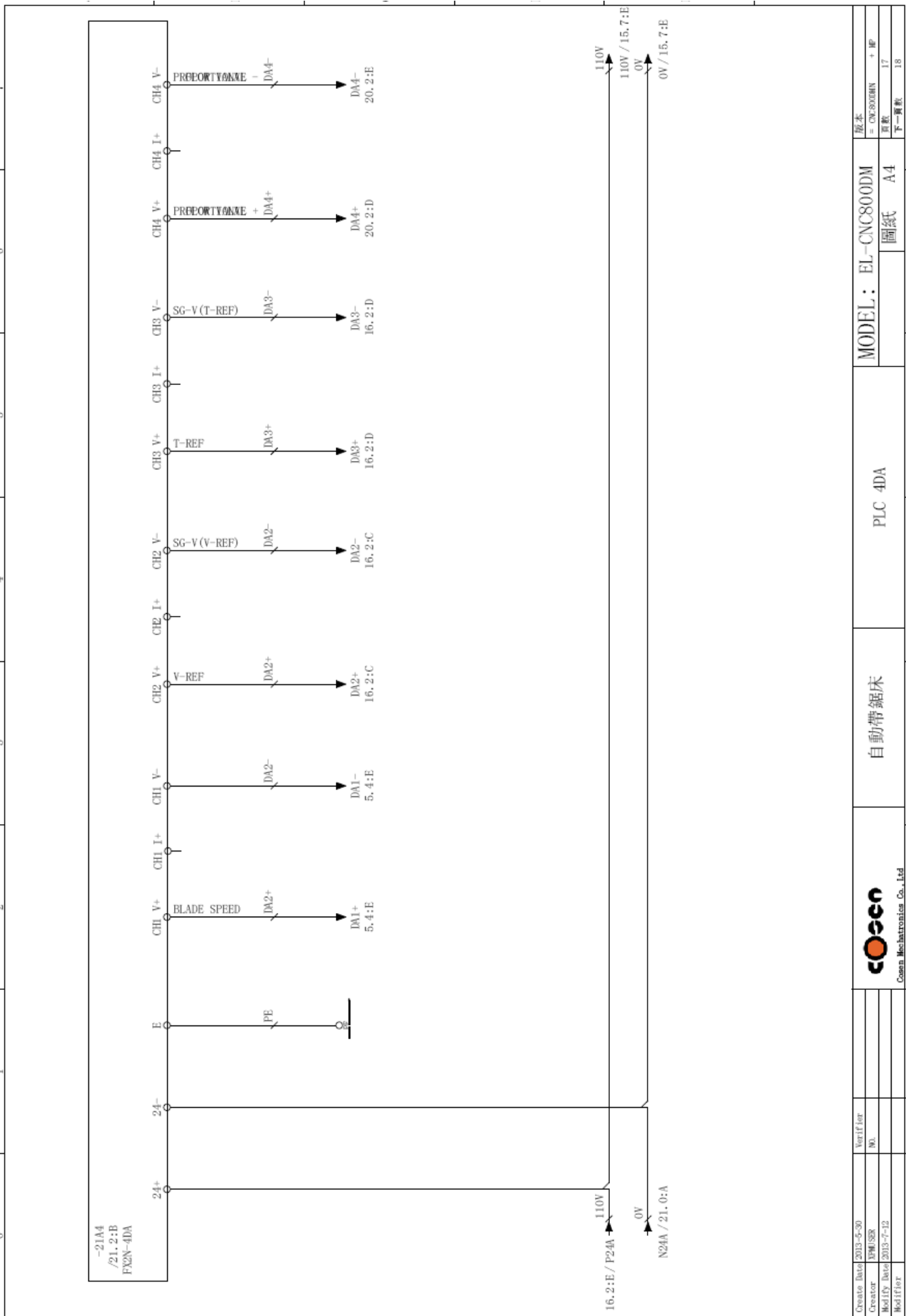



Fig. 5-18 PLC 4DA layout (CE)

Create Date	2013-5-30	Verifier	
Creator	YFM/ISEK	WA	
Modify Date	2013-7-12		
Modifier			
 Cosen Mechatronics Co., Ltd.		自動帶鋸床	
MODEL : EL-CNC800DM		PLC 4DA	
圖紙 A4		版本 = CNC800DM + MP	
		頁數 17	
		下一頁數 18	

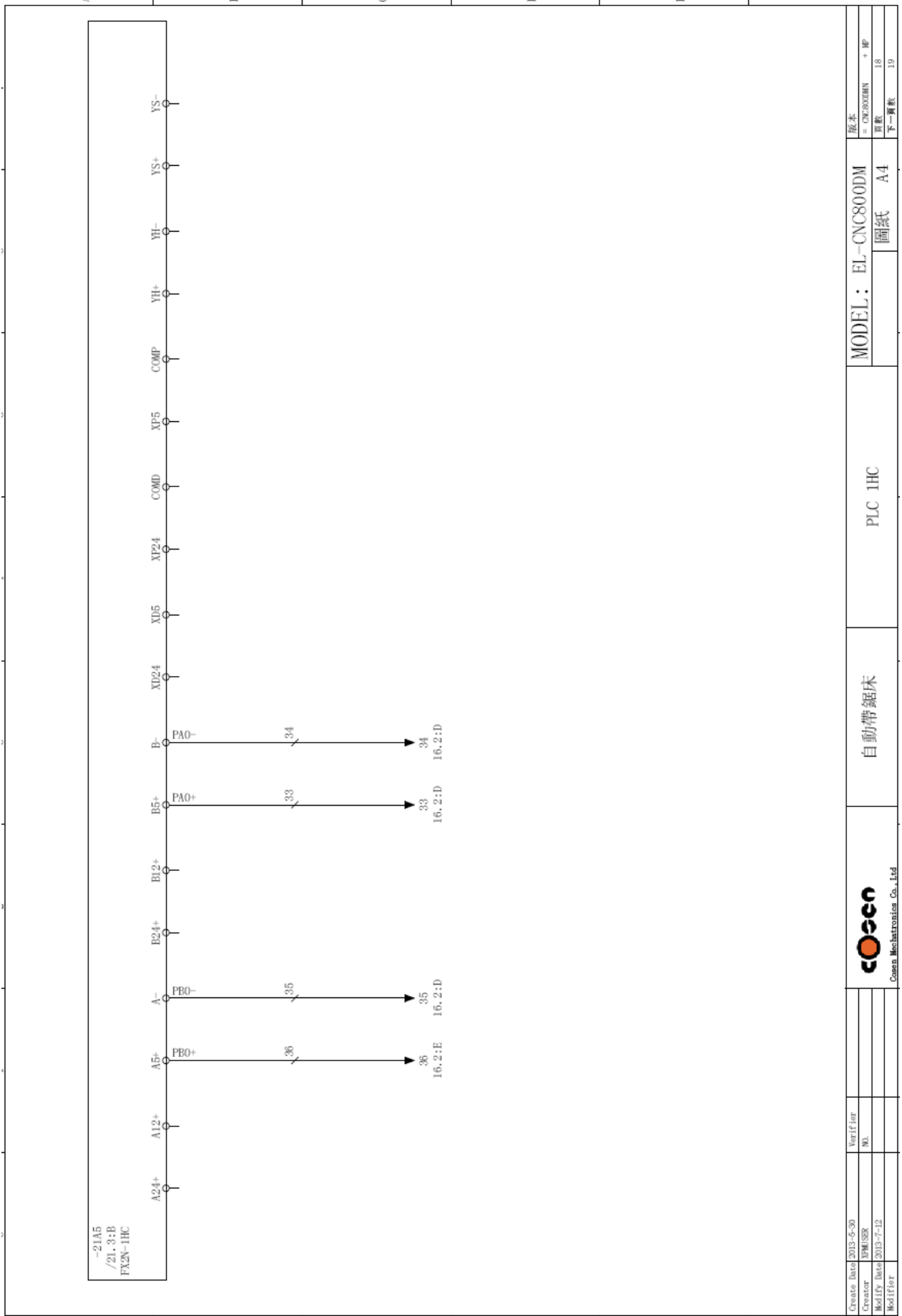


Fig. 5-19 PLC 1HC layout (CE)

MODEL: EL-CNC800DM	図紙 A4	PLC 1HC	自動帶鋸床	 Cosen Mechatronics Co., Ltd.	Create Date: 2013-5-30 Creator: JPM/SSK Modify Date: 2013-7-12 Verifier: ML	版本 = CNC800DM + RP 頁數 18 下一頁數 19
MODEL: EL-CNC800DM		PLC 1HC	自動帶鋸床			

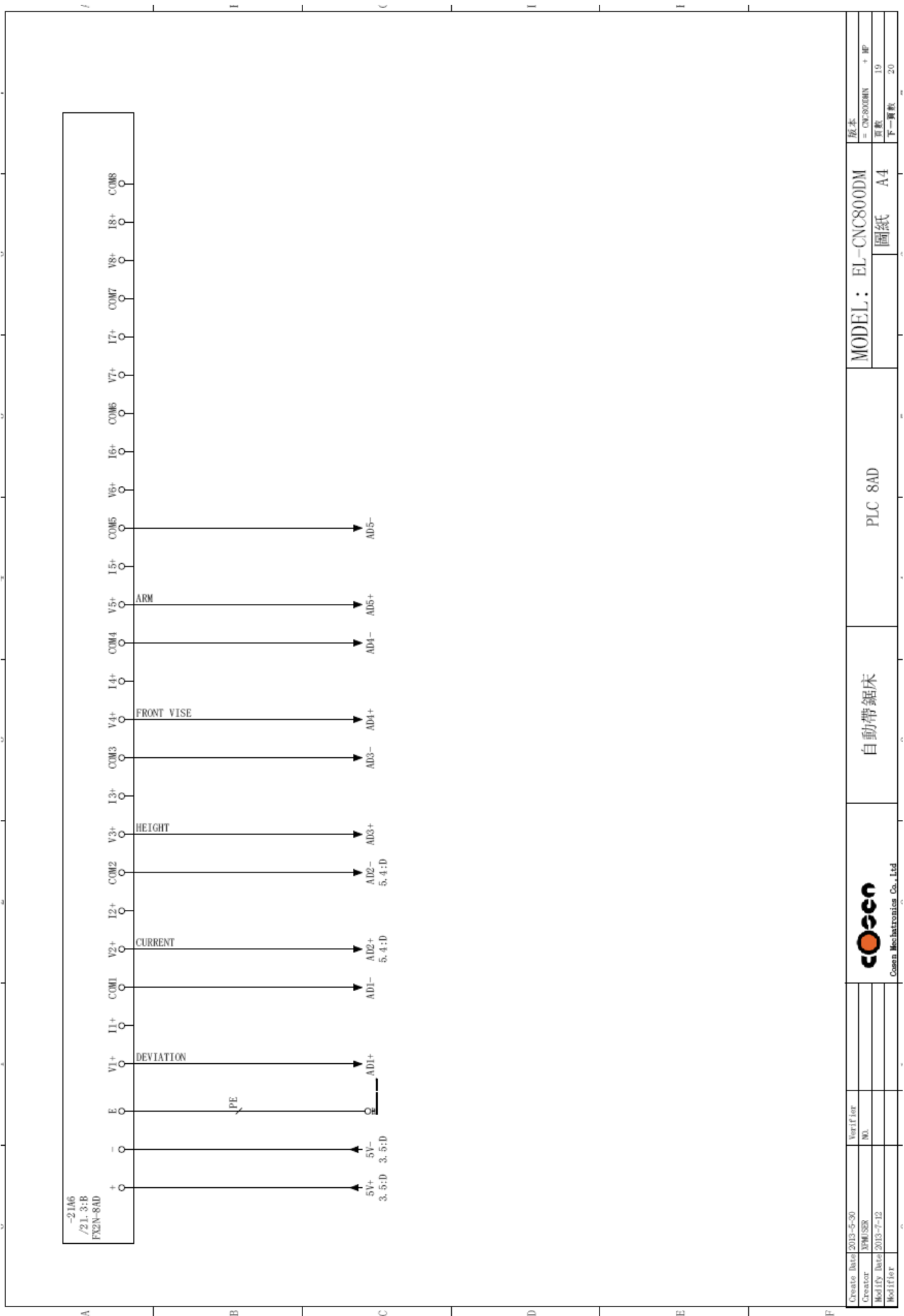



Fig. 5-20 PLC 8AD layout (CE)

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Creator: YPM/SZR	NO.	页码 19
Modify Date: 2013-7-12		下一页码 20
Modifier:		
 Cosen Mechatronics Co., Ltd.		MODEL: EL-CNC800DM 图式 A4
自動帶鋸床		PLC 8AD

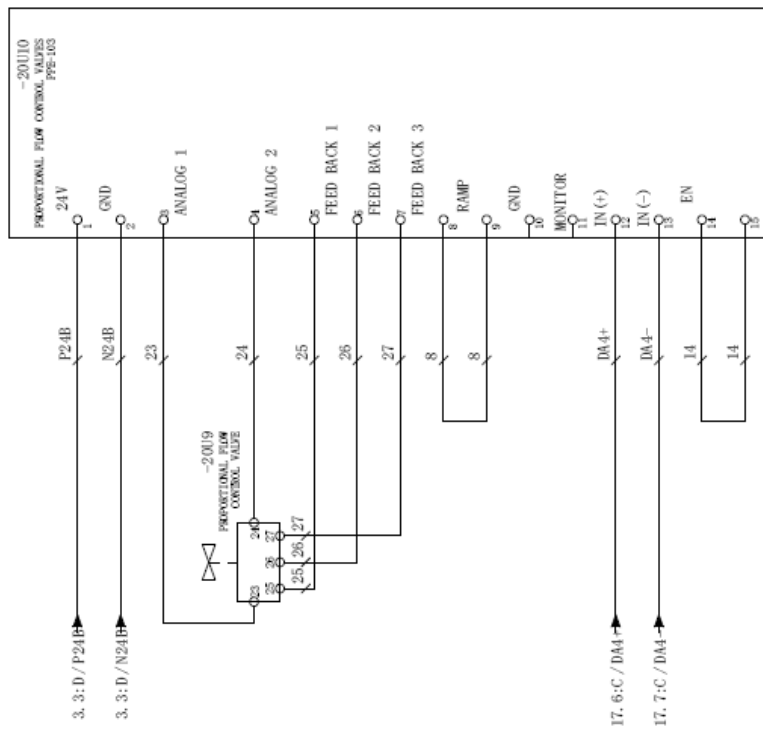



Fig. 5-21 PROPORTIONALVALVE AMPLIFIER (CE)

Create Date	2015-5-30	Verifier	
Creator	YFW/SSR	NO.	
Modify Date	2015-7-12		
Modifier			
		Cosen Mechatronics Co., Ltd	
自動帶鋸床		PROPORTIONALVALVE AMPLIFIER	
MODEL: EL-CNC800DM		圖紙 A4	
		版本	+ RP
		= CNC800DM	20
		頁數	
		下一頁數	21

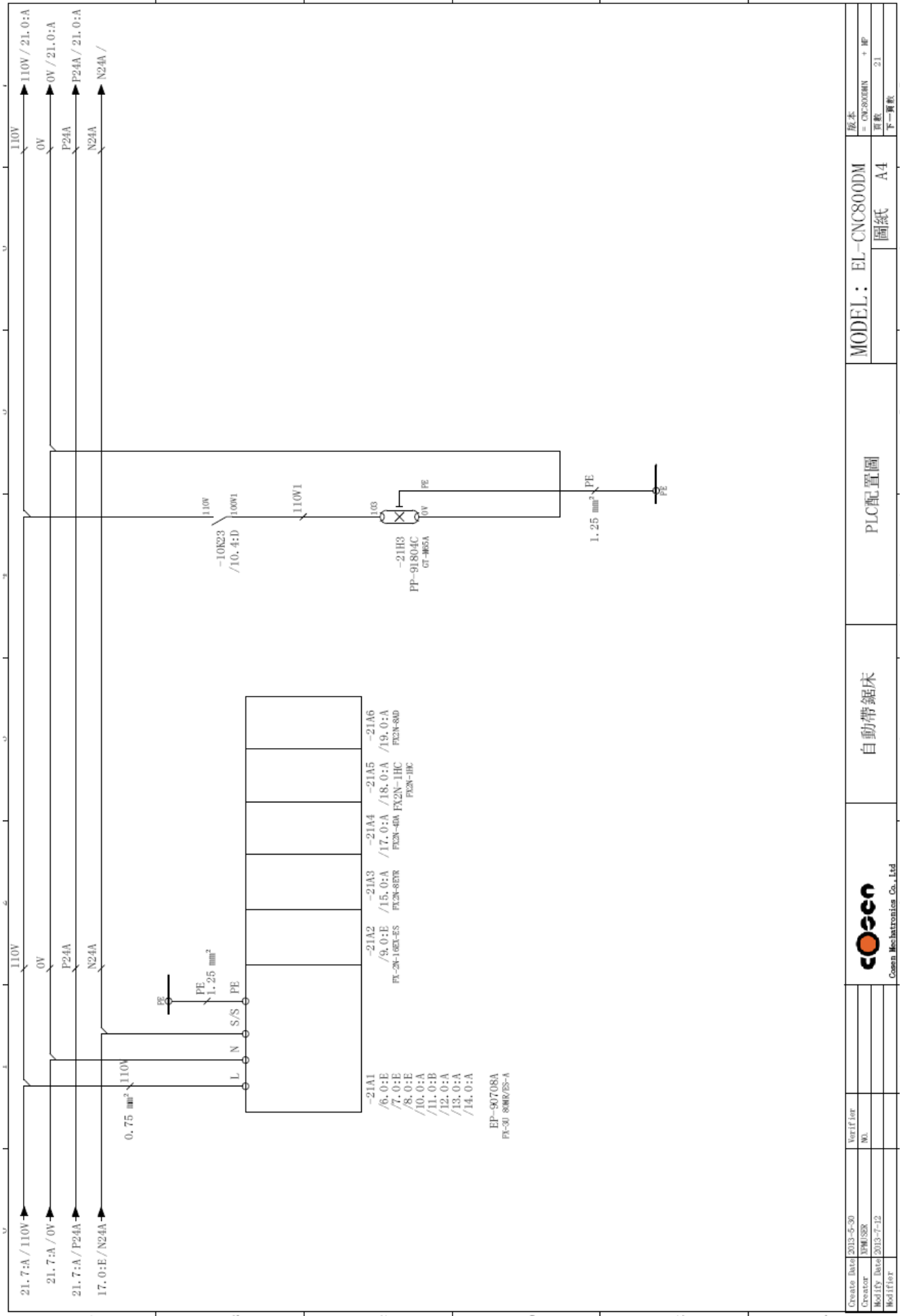


Fig. 5-22 PLC layout (CE)

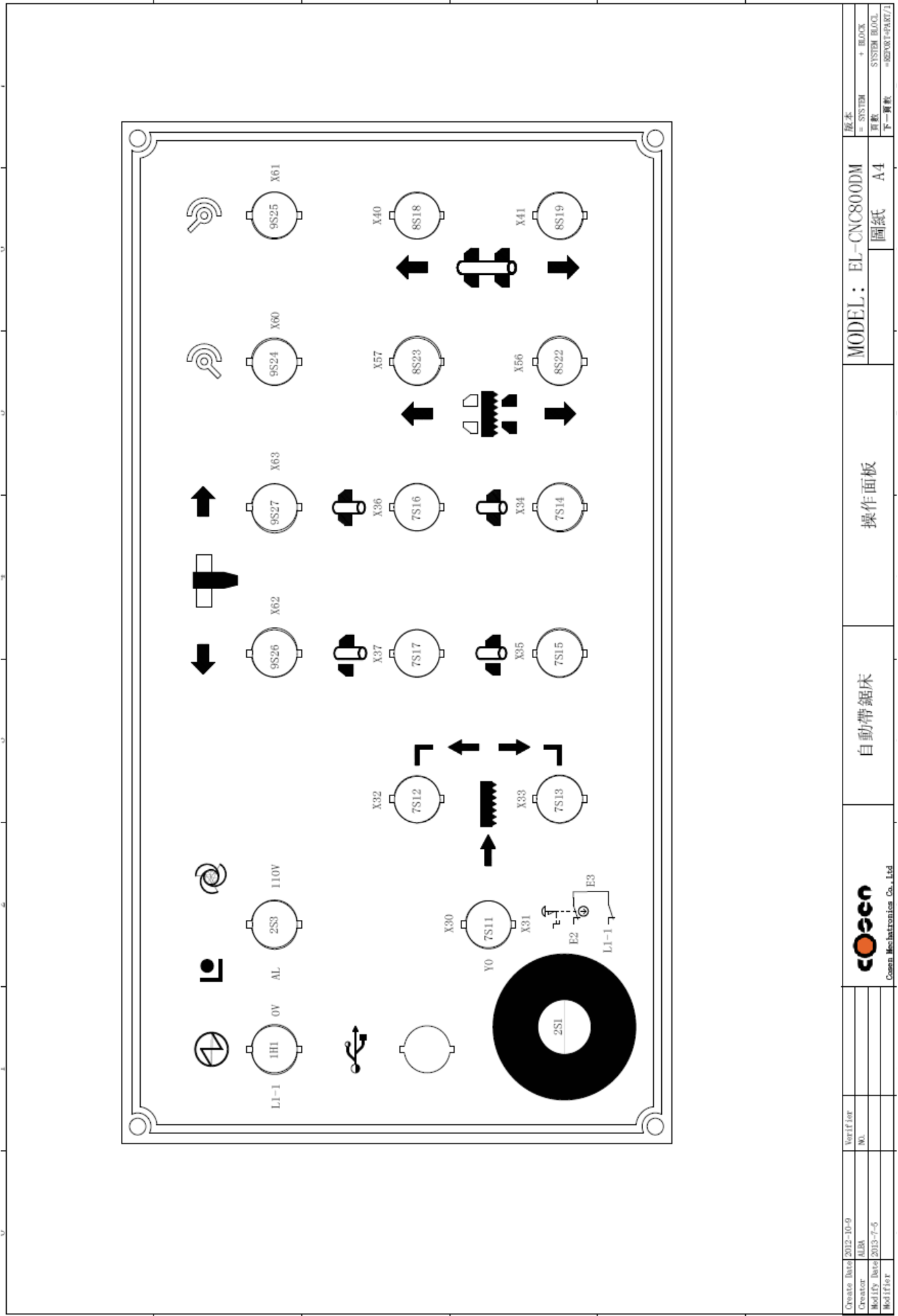


Fig. 5-23 Control panel layout (CE)

Create Date: 2012-10-9 Creator: ALBA Modify Date: 2013-7-5 Modifier:	Verifier No.	 Cosma Mechatronics Co., Ltd.	自動帶鋸床	MODEL: EL-CNC800DM 圖紙 A4	版本 = SYSTEM + BLOCK 圖紙 = SYSTEM BLOCK 下一頁數 = NEXT PART / 1
			操作面板		



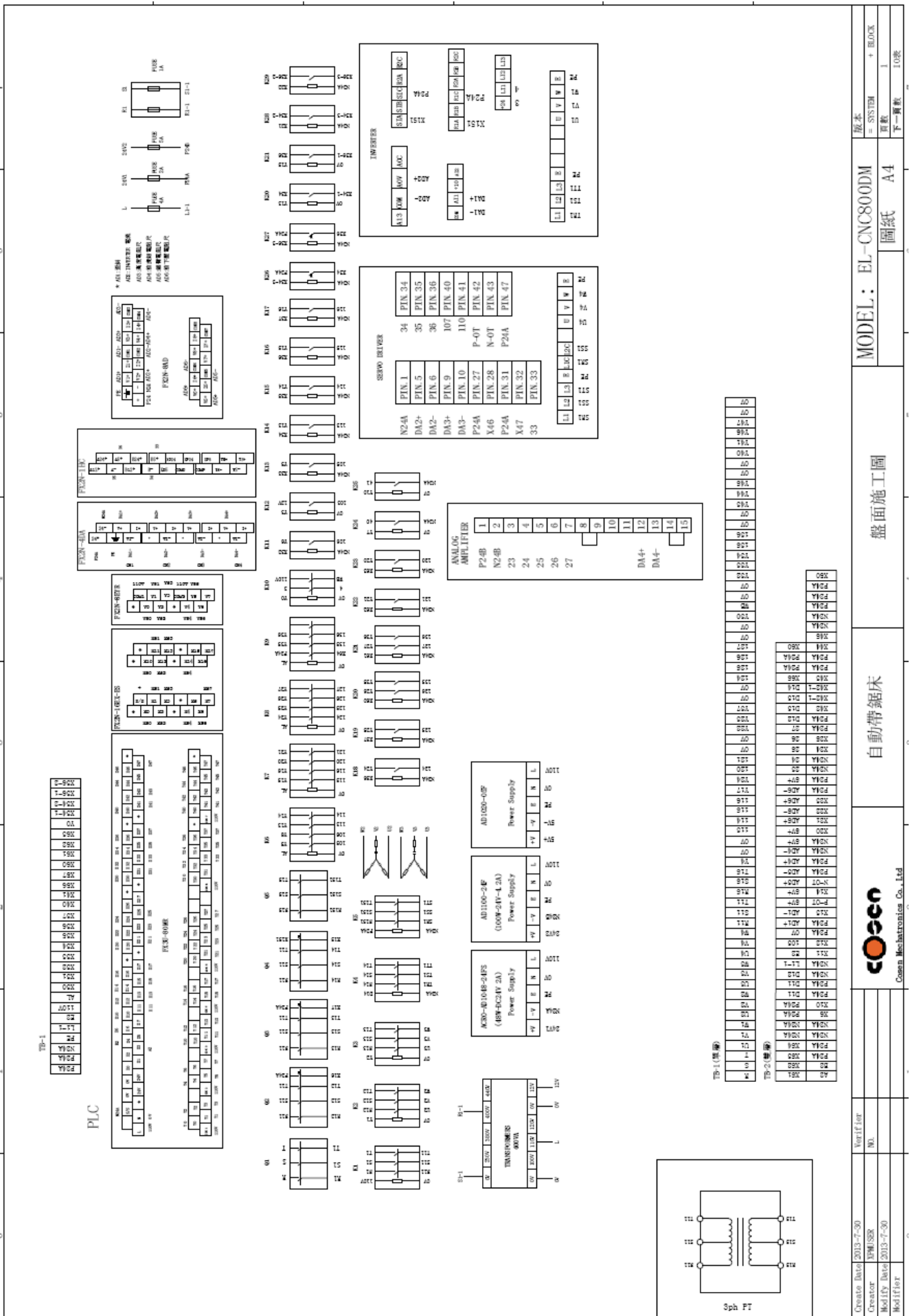


Fig. 5-24 Wiring diagram (CE)

Section 6

# *HYDRAULIC SYSTEM*

**HYDRAULIC CIRCUIT DIAGRAMS**

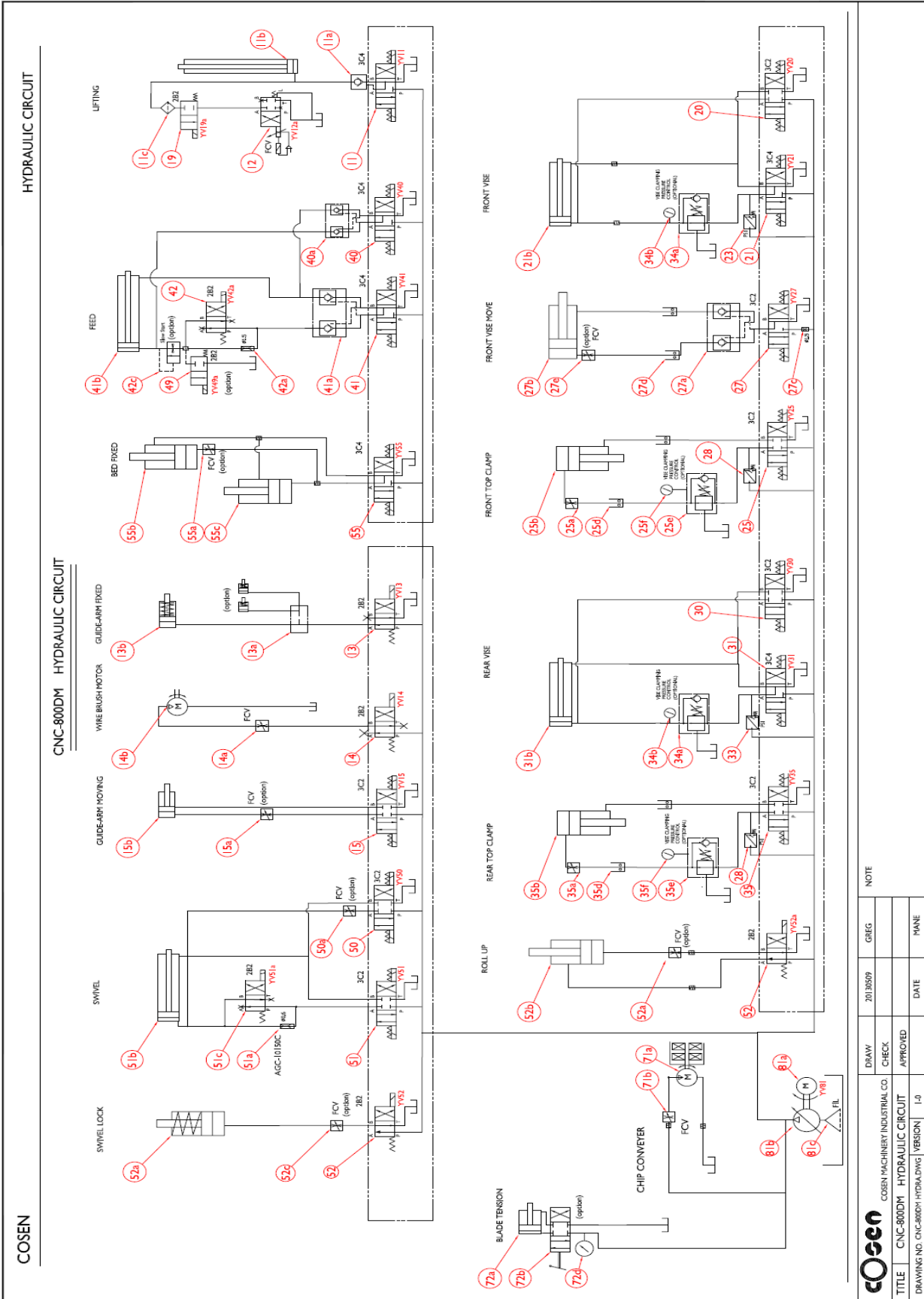


Fig. 6-1 Hydraulic circuit layout

<b>COSEN</b> COSEN MACHINERY INDUSTRIAL CO.	DRAW	20130509	GREG	NOTE
	CHECK			
TITLE	CNC-800DM HYDRAULIC CIRCUIT	APPROVED		
DRAWING NO.	CNC-800DM-HYDRA.DWG	VERSION	1-0	DATE
			MADE	

## Hydraulic parts list for CNC-800DM

REF NO.	PART NO.	PART NAME IN CHINESE	PART NAME	QYT
11	PP-43521	電磁閥	Solenoid valve	1
11a	PP-43125	引導止回閥	Guiding check valve	1
11b	AGB-707019G	鋸弓油壓缸組	Sawbow cylinder assembly	1
11c	AGB-707270	濾油器組	Filter assembly	1
19	PP-43601	電磁閥	Solenoid valve	1
12	PP-43508	電磁閥	Solenoid valve	1
13	PP-43503	電磁閥	Solenoid valve	1
13a	AGB-70715	鎢鋼片油缸	Hydraulic cylinder	2
13b	SGJ-32800-1	鋸臂固定油壓缸組	Guide arm	1
14	PP-43503	電磁閥	Solenoid valve	1
14a	PP-43117	流量閥	Flow valve	1
14b	PP-31174C	馬達	Motor	1
15	PP-43525	電磁閥	Solenoid valve	1
15a	PP-43117	流量閥	Flow valve	1
15b	PP-43422A	油壓缸	Hydraulic cylinder	1
20	PP-43525	電磁閥	Solenoid valve	1
21	PP-43521	電磁閥	Solenoid valve	1
21b	PP-43421B	油壓缸	Hydraulic cylinder	1
23	NGG-33000-1	壓差閥組	pressure valve	1
24a	PP-43127A	減壓閥	Pressure regulator	1
24b	PP-43311A	壓力表	Pressure gauge	1
25	PP-43525	電磁閥	Solenoid valve	1
25a	PP-43117	流量閥	Flow valve	1
25b	PP-43473	油壓缸	Hydraulic cylinder	1
25e	PP-43127A	減壓閥	Pressure regulator	1
25f	PP-43311A	壓力表	Pressure gauge	1
27	PP-43525	電磁閥	Solenoid valve	1
27a	PP-43125	引導止回閥	Guiding check valve	1
27b	PP-43455B	油壓缸	Hydraulic cylinder	1
27c	PP-43117	流量閥	Flow valve	1
30	PP-43525	電磁閥	Solenoid valve	1
31	PP-43521	電磁閥	Solenoid valve	1

## Hydraulic parts list for CNC-800DM

REF NO.	PART NO.	PART NAME IN CHINESE	PART NAME	QYT
31b	PP-43468	油壓缸	Hydraulic cylinder	1
33	NGG-33000-1	壓差閥組	pressure valve	1
34a	PP-43127A	減壓閥	Pressure regulator	1
34b	PP-43311A	壓力表	Pressure gauge	1
35	PP-43525	電磁閥	Solenoid valve	1
35a	PP-43117	流量閥	Flow vlave	1
35b	PP-43473	油壓缸	Hydraulic cylinder	1
35e	PP-43127A	減壓閥	Pressure regulator	1
35f	PP-43311A	壓力表	Pressure gauge	1
40	PP-43521	電磁閥	Solenoid valve	1
40a	PP-43125	引導止回閥	Guiding check valve	1
41	PP-43521	電磁閥	Solenoid valve	1
41a	PP-43125	引導止回閥	Guiding check valve	1
41b	PP-43450B	油壓缸	Hydraulic cylinder	1
42	PP-43503	電磁閥	Solenoid valve	1
42a	AGC-10150	針孔閥組	Needle valve assembly	1
42c	AHB-16100-1	緩衝閥	Buffer valve	1
49	PP-43600	電磁閥	Solenoid valve	1
50	PP-43525	電磁閥	Solenoid valve	1
50a	PP-43117	流量閥	Flow vlave	1
51	PP-43525	電磁閥	Solenoid valve	1
51a	PP-43117	流量閥	Flow vlave	1
51b	PP-31508	油壓馬達	Hydraulic motor	1
52	PP-43503	電磁閥	Solenoid valve	1
52a	NDE-1021	鎖定油缸	Lock Cylinder	1
53	PP-43503	電磁閥	Solenoid valve	1
53a	PP-43117	流量閥	Flow vlave	1
53b	PP-43462	油壓缸	Hydraulic cylinder	1
55	PP-43521	電磁閥	Solenoid valve	1
55a	PP-43117	流量閥	Flow vlave	1
55b	WC800D-0002	油壓缸	Hydraulic cylinder	1
55c	WC800D-0002	油壓缸	Hydraulic cylinder	1

## Hydraulic parts list for CNC-800DM

REF NO.	PART NO.	PART NAME IN CHINESE	PART NAME	QYT
71a	PP-31640-1	油壓馬達	Hydraulic motor	1
71b	PP-43117	流量閥	Flow vlave	1
72a	AGB-707209-1	張力油壓缸組	Tensioner cylinder assembly	1
72b	PP-43842	手動方向閥 三位	Manual three way valve	1
72d	PP-43311A	壓力表	Pressure gauge	1
81a	PP-31451	油壓馬達	Hydraulic motor	1
81b	PP-32232	油壓幫浦	Hydraulic pump	1
81c	PP-43335	濾油網	Filter	1

# *BANDSAW CUTTING: A PRACTICAL GUIDE*

## **INTRODUCTION**

### **SAW BLADE SELECTION**

### **SOME SAWING PRACTICES**

## **INTRODUCTION**

COSEN band saw machines are designed to be installed with high quality using high speed saw blades for maximizing productivity. To be able to use this kind of high performance band saw blade, the machine has to be of rugged design, has high quality saw blade guides, has sufficient motor horse power for high saw band speeds, and has to be able to apply necessary tension to the saw bands. Your COSEN machine has all these features to provide a better service for you.

The saw blade is guided through the cutting area by roller guides to keep it straight as it comes off the driving wheels. The precision carbide inserted guides then holds the blade securely and accurately throughout the sawing process. The tension of the saw blade is adjusted through the tensioning device on the strong saw bow. The cutting feed and down feed pressure of the blade is regulated automatically by hydraulic regulation.

## **SAW BLADE SELECTION**

The factors affecting cutting performance are:

- Type of material
- Material size and shape
- Guide spacing
- Blade selection
- Blade speed and feed
- Blade tension
- Blade vibration
- Coolant

Material and its relation to the cutting rate:

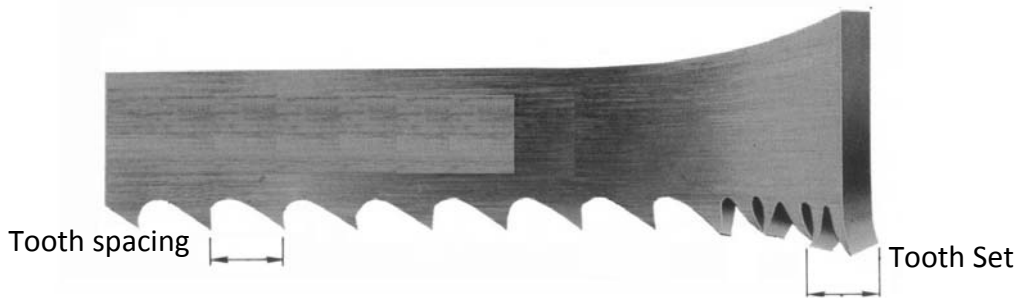


Fig. 7.1 Description of Band

- Depending on the hardness of the material the cutting rate will increase or decrease. For example, it takes more time to cut stainless steel than to cut cast iron.
- The surface conditions will also affect the cutting rate. If there are places on the surface on the material which are hard, a slower blade speed will be required or blade damage may result.
- It will be slower to cut tubing than to cut solids, because the blade must enter the material twice, and because coolant will not follow the blade as well.
- Tough or abrasive materials are much harder to cut than their machinability rating would indicate.
- Tooth spacing is determined by the hardness of the material and its thickness in cross section.
- Tooth set prevents the blade from binding in the cut. It may be either a "regular set" (also called a "raker set" ) or a "wavy set".
- The regular or raker set is most common and consists of a pattern of one tooth to the left. Set to the right, to the left and one which is straight, or unset. This type of set is generally used where the material to be cut is uniform in size and for contour cutting.
- Wavy set has groups of teeth set alternately to right and left, forming a wave-like pattern. This reduces the stress on each individual tooth, making it suitable for cutting thin material or a variety of materials where blade changing is impractical. Wavy set is often used where tooth breakage is a problem. This is shown in Fig. 7.2 as follows:

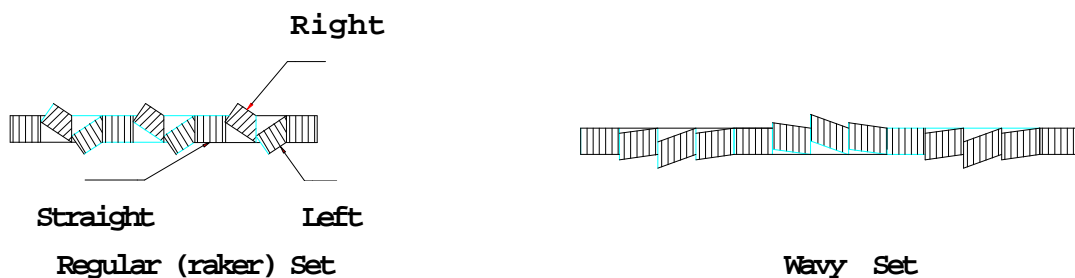


Fig. 7.2 The saw set



### Material Size and Shape:

The optimum material width for a band saw blade is 1 inch wide by 0.35 thick and is about 5 inches long. Below this width tooth loading may become excessive and the cutting rate must be reduced. Above this width blade control begins to be lost, as discussed below. Since the blade "sees" only that material it is cutting, the shape of the stock being cut will also affect cutting speeds, particularly if the piece is excessively wide or if it varies in the dimensions being cut.

### Guide Spacing:

The rigidity of the blade is a function of guide spacing, with rigidity being reduced to the third power as the distance between the guides increases. For example, with guides spaced 2 inches apart, blade deflection might be approximately 0.2. Under the same conditions, but with the guides spaced at 4 inches apart, blade deflection would be approximately 0.8.

This is a much simplified version of the formula, because it does not consider band tension or guide design. It is important to recognize, for example that rollers are considered as a pivotal contact. Whereas carbide faces could be considered as anchored supports. A more complete deviation, including band tension and guide design, is included in Roark's handbook, "Formula for stress and strain".

### Blade selection:

There are five types of blade material generally used:

- Hard-back carbon
- Semi-high speed
- High speed
- Carbon
- Electron-welded blade

In most high speed production cutting either the semi-high speed or the electron-welded band are used. Electron welded blade is the best blade. But it is also the most expensive. To construct the electron-welded blade, M-2 tool steel is welded to the blade back. Therefore the blade is capable of very high surface speed. The semi-high speed blade is used more in structural because it is capable of taking a great deal more abuse. The hard-back carbon blade's teeth does not have red-hardness but if the blade is run slowly it can be very economical. We do not recommend carbon blades because the back of the blade is not sufficiently strong to stand adequate tension and because it has poor resistance to heat and abrasion. Usually, the coarse hook tooth blade will give better results, but accurate feed control is a must with a coarse tooth blade.

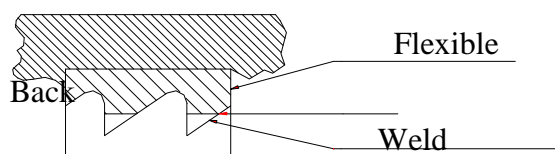


Fig. 7.3 Electron Welded Blade

A particular blade may have teeth which are too hard at the tips, causing them to break off in the material. This is most likely to happen as a result of chips wedging together in the cut. A broken tooth in the material can easily cause dulling on one side of the entire blade before it is dislodged from the cut.

### Blade Speed and Feed:

Blade speed is generally limited by vibration and the ability to keep the blade sufficiently cool to avoid dulling the teeth. A blade which is running fast and taking a very light cut will dull quickly because the tips of the teeth will overheat from the rubbing action. If, however, we force the blade teeth deeper into the material, the blade will be less sensitive to heat, because the teeth are cutting more and rubbing less.

### Tooth Form and Spacing:

The selection of a tooth form generally is determined by the material to be cut. There are three general factors to consider: tooth form, style or shape of the teeth; tooth spacing, the number of teeth to the inch; and tooth set, which provides clearance for the body of the blade. Three styles of tooth are shown in Fig. 7.4 below:

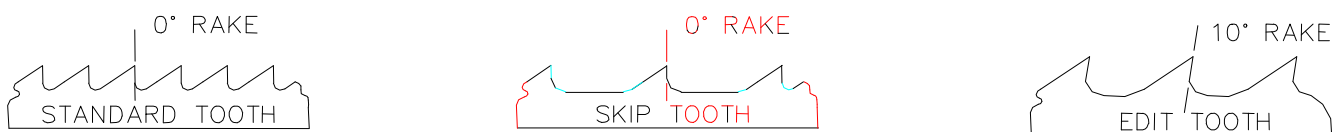


Fig. 7.4 Three styles of tooth

## **SOME SAWING PRACTICES**

### **Saw Pitch Selection**

Sawing “Rules of Thumb”:

1. The thinner the stock, the finer the saw pitch
2. The thicker the stock, the coarser the saw pitch
3. The more difficult the stock, the finer the saw pitch
4. The softer the material, the coarser the saw pitch

Always have at least three teeth in contact with the material being cut.

### **Material Size and Saw Pitch**

Anytime during the cutting operation, at least three teeth must be in contact with the material being cut. Figure 7.5 shows some sawing practices:

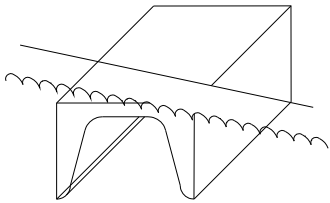
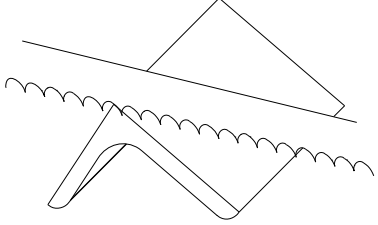
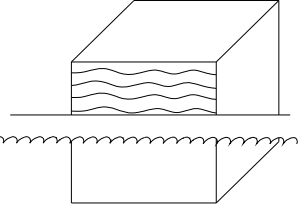
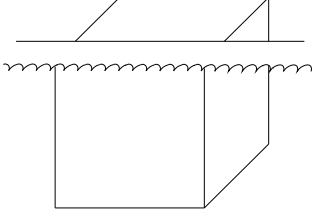
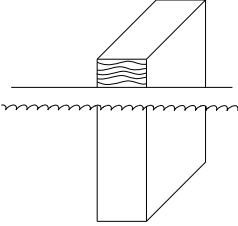
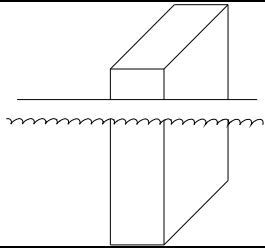




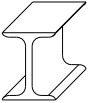

<b>SAWING PRACTICES</b>	
<b>CORRECT</b>	<b>INCORRECT</b>
	
several teeth contact work	teeth strike sharp edge
	
Coarse teeth clear chips freely	Teeth too fine for large solids
	
Three or more teeth on cutting wall	Coarse teeth rip on thin wall

Fig. 7.5 Some sawing practices

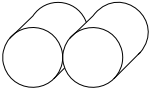
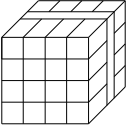
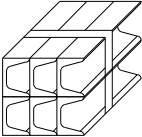
Solid Stock:

STYLE	up to 25 mm (1")	25-100mm (1-4")	100-250mm (4-10")
	8-10 TPI (Teeth per inch)	6-8 TPI	3-4 TPI
			
			

Structurals:

STYLE	up to 10 mm (3/8")	10-20mm (3/8-3/4")	above 20mm (3/4")
	10-8 TPI	8-10 TPI	6-8 TPI
			
			

Solid Bundle:

STYLE	up to 20 mm (3/4")	20-80mm (3/4-3 1/4")	above 80mm (3 1/4")
	8 - 10 TPI	2 - 8 TPI	4 - 6 TPI
			
			

# *MAINTENANCE & SERVICE*

## **INTRODUCTION**

### **BASIC MAINTENANCE**

#### **MAINTENANCE SCHEDULE**

**BEFORE BEGINNING A DAY'S WORK**

**AFTER ENDING A DAY'S WORK**

**EVERY MONTH**

**EVERY THREE MONTHS**

**EVERY SIX MONTHS**

#### **STORAGE CONDITIONS**

#### **TERMINATING THE USE OF MACHINE**

#### **OIL RECOMMENDATION FOR MAINTENANCE**

## **INTRODUCTION**

For the best performance and longer life of the band saw machine, a maintenance schedule is necessary. Some of the daily maintenance usually takes just a little time but will give remarkable results for the efficient and proper operation of cutting.

## **BASIC MAINTENANCE**

It is always easy and takes just a little effort to do the basic maintenance. But it always turns out to be a very essential process to assure the long life and efficient operation of the machine. Most of the basic maintenance requires the operator to perform it regularly.

## **MAINTENANCE SCHEDULE**

We suggest you do the maintenance on schedule. The recommended schedule includes three periods, 1. Daily maintenance. 2. Monthly maintenance. 3. Six months maintenance.

## Before beginning a day's work

1. Please check the hydraulic oil level. If oil level volume is below 1/2, please add oil as necessary. (Filling up to 2/3 level is better for system operation.)
2. Please check the cutting fluid level, adding fluid as necessary. If the fluid appears contaminated or deteriorated, drain and replace it.
3. Please check the saw blade to ensure that it is properly positioned on both the drive and idle wheels.
4. Please make sure that the saw blade is properly clamped by the left and right inserts.
5. Please check the wire brush for proper contact with the saw blade. Replace the wire brush if it is worn out.

## After ending a day's work

Please remove saw chips and clean the machine with discharging the cutting fluid when work has been completed.



Do not discharge cutting fluid while the saw blade is operating because it will cause severe injury on operator's hand.



Be sure the saw blade is fully stop, it will be performed after working inspection.

## Every month



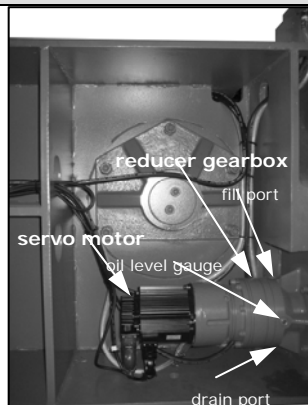
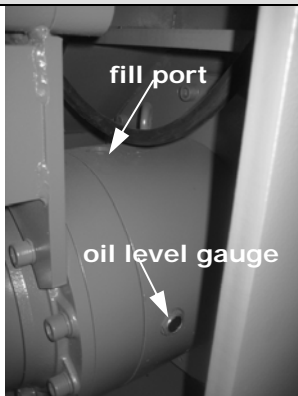
Please apply grease to the following points:

1. Idle wheel
2. Drive wheel
3. Blade tension device

### Recommended Grease:

- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

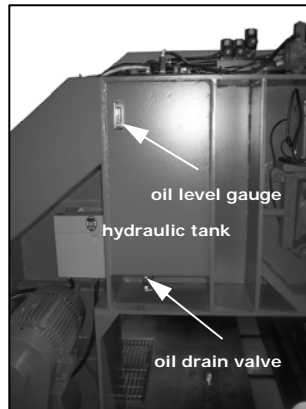
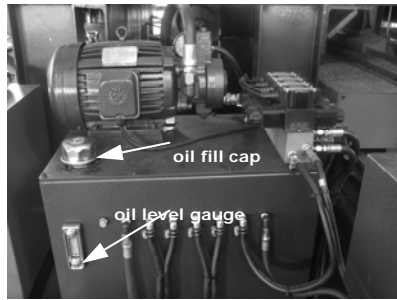
## Every three months



Replace the transmission oil after operating for three months (or 600 hours).

### Recommended Grease:

- Shell Alvania EP Grease 2
- Mobil Mobilplex 48 (600W Cylinder oil)



1. Clean the filter of the cutting fluid.
2. Replace the transmission oil for every half of a year (or 1200 hours). Check the sight gauge to ascertain the transmission level.

Recommended TRANSMISSION OIL

- Omala oil HD220
- Mobil comp 632 600W Cylinder oil

3. Replace the hydraulic oil.

Recommended HYDRAULIC OIL

- Shell Tellus 27
- Mobil DTE OIL light Hydraulic28

## STORAGE CONDITIONS

Generally, this machine will be stored on the following conditions in future:

- (1) Turn off the power.
- (2) Ambient temperature: 5°C ~ 40°C
- (3) Relative humidity: 30%~95% (without condensation)
- (4) Atmosphere: use a plastic canvas to cover machine to avoid excessive dust, acid fume, corrosive gases and salt.
- (5) Avoid exposing to direct sunlight or heat rays which can change the environmental temperature.
- (6) Avoid exposing to abnormal vibration.
- (7) Must be connected to earth.

## TERMINATING THE USE OF THE MACHINE

Waste disposal:

When your machine can not work anymore, you should leak out the oil from machine body. Please storage the oil in safe place with bottom. Ask a environment specialist to handle the oil. It can avoid soil pollution. The oil list in machine:

- Hydraulic oil
- Cutting fluid
- Drive wheel gear oil

## OIL RECOMMENDATION FOR MAINTENANCE

Item	Method	Revolution	Suggest oil
Dovetail guide	Keep grease covered. Antirust.	Daily	Shell R2
Roller bearing	Sweep clean and oil with lubricant.	Daily	SEA #10
Bed roller / surface	Sweep clean and oil with lubricant.	Daily	SEA #10
Nipples of bearing	Use grease gun, but not excess.	Monthly	Shell R2
Blade tension device	Use grease gun, but not excess.	Monthly	Shell R2
Reducer	Inspect once a week. Change oil of 600 hours of using. Change it every year.	Regularly	Omala oil HD220 Mobil Gear 630
Hydraulic system	Inspect half a year. Change oil every year.	Regularly	Shell Tellus 32 Mobil DTE oil Light Hydraulic 24
Bearing	Inserts	Oil with lubricant, but not excess.	Daily
	Band wheel	Oil with lubricant, but not excess.	Weekly
	Cylinder	Oil with lubricant, but not excess.	6 Monthly
	Wire brush	Oil with lubricant, but not excess.	6 Monthly



- 1. Turn off the stop circuit breaker switch before servicing the machine.**
- 2. Then post a sign to inform people that the machine is under maintenance.**
- 3. Drain all of the cutting fluid and oil off and carefully treat them to avoid pollution.**



# **TROUBLESHOOTING**

## **INTRODUCTION**

## **PRECAUTIONS**

## **GENERAL TROUBLES & SOLUTIONS**

## **MINOR TROUBLES & SOLUTIONS**

## **MOTOR TROUBLES & SOLUTIONS**

## **BLADE TROUBLES & SOLUTIONS**

## **SAWING PROBLEMS & SOLUTIONS**

## **RE-ADJUSTING THE ROLLER TABLE**

## **INTRODUCTION**

All the machines manufactured by COSEN pass a 72 hours continuously running test before shipping out and COSEN is responsible for the after sales service problems during the warranty period if the machines are used normally. However, there still exist the some unpredictable problems which may disable the machine from operating.

Generally speaking, the system troubles in this machine model can be classified into three types, namely GENERAL TROUBLES, MOTOR TROUBLES and BLADE TROUBLES. Although you may have other troubles which can not be recognized in advance, such as malfunctions due to the limited life-span of mechanical, electric or hydraulic parts of the machine.

COSEN has accumulated enough experiences and technical data to handle all of the regular system troubles. Meanwhile, the engineering department of COSEN had been continuously improving the machines to prevent all possible troubles.

It is hoped that you will give COSEN your maintenance experience and ideas so that both sides can achieve the best performance.

## PRECAUTIONS

When an abnormality occurs in the machine during operation, you can do it yourself safely. If you have to stop machine motion immediately for parts exchanging, you should do so according to the following procedures:

- Press HYDRAULIC MOTOR OFF button or EMERGENCY STOP button.
- Open the electrical enclosure door.
- Turn off breaker.



**BEFORE ANY ADJUSTMENT OR MAINTENANCE OF THE MACHINE, PLEASE MAKE SURE TO TURN OFF THE MACHINE AND DISCONNECT THE POWER SUPPLY.**

## GENERAL TROUBLES AND SOLUTIONS



**DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.**

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Motor stalls	Excessive belt tension	Adjust belt tension so that belt does not slip on drive pulley while cutting ( 1/2" Min. deflection of belt under moderate pressure.)
	Excessive head pressure	Reduce head pressure. Refer to Operating Instructions "Adjusting Feed".
	Excessive blade speed	Refer to Operating Instructions "Speed Selection".
	Improper blade selection	Refer to Operating Instructions "Blade Selection".
Cannot make square cut	Dull blade	Replace blade.
	Guide rollers not adjusted properly	Refer to Adjustments.
	Rear vise jaw not adjusted properly	Set fixed vise jaw 90° to blade.
	Excessive head pressure	Reduce head pressure. Refer to operating instructions "Adjusting Feed."
Increased cutting time	Dull blade	Replace blade
	Insufficient head pressure	Increase head pressure. Refer to Operating Instructions "Adjusting Feed."
	Reduce blade speed	Refer to Operating Instructions "Speed Selection."
Will not cut	Motor running in wrong direction	Reverse rotation of motor. (Motor rotation C.C.W. pulley end.)
	Blade teeth pointing in wrong direction	Remove blade, turn blade inside out. Re-install blade. (Teeth must point in direction of travel. )
	Hardened material	Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required.)

## MINOR TROUBLES & SOLUTIONS

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Saw blade motor does not run even though blade drive button is pressed.	Overload relay activated	Reset
	Saw blade is not at forward limit position.	Press SAW FRAME FORWARD button

## MOTOR TROUBLES & SOLUTIONS

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Motor will not start	Magnetic switch open, or protector open.	Reset protector by pushing red button (inside electric box.)
	Low voltage	Check power line for proper voltage.
	Open circuit in motor or loose connections.	Inspect all lead terminations on motor for loose or open connections.
Motor will not start, fuse or circuit breakers "blow".	Short circuit in line, cord or plug.	Inspect line, cord and plug for damaged insulation and shorted wire.
	Short circuit in motor or loose connections	Inspect all lead terminations on motor for loose or shorted terminals or worn insulation on wires.
	Incorrect fuses or circuit breakers in power line.	Install correct fuses or circuit breakers.
Motor fail to develop full power. (Power output of motor decreases rapidly with decrease in voltage at motor terminals.)	Power line overloaded with lights, appliances and other motors.	Reduce the load on the power line.
	Undersize wires or circuit too long.	Increase wire sizes, or reduce length of wiring
	General overloading of power company's facilities.	Request a voltage check from the power company
Motor overheat	Motor overloaded.	Reduce load on motor
	Air circulation through the motor restricted.	Clean out motor to provide normal air circulation through motor.
Motor stalls (Resulting in blown fuses or tripped circuit breakers)	Short circuit in motor or loose connections.	Inspect terminals in motor for loose or shorted terminals or worn insulation on lead wires.
	Low voltage	Correct the low line voltage conditions.
	Incorrect fuses or circuit breakers in power line.	Install correct fuses circuit breakers.
	Motor overloaded	Reduce motor load.
Frequent opening of fuses or circuit breakers.	Motor overloaded	Reduce motor load
	Incorrect fuses or circuit breakers.	Install correct fuses or circuit breakers.

## BLADE TROUBLES AND SOLUTIONS



**DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.**

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Teeth strippage	Too few teeth per inch	Use finer tooth blade
	Loading of gullets	Use coarse tooth blade or cutting lubricant.
	Excessive feed	Decrease feed
	Work not secured in vise	Clamp material securely
Blade breakage	Teeth too coarse	Use a finer tooth blade
	Misalignment of guides	Adjust saw guides
	Dry cutting	Use cutting lubricant
	Excessive speed	Lower speed. See Operating Instructions "Speed selection."
	Excessive speed	Reduce feed pressure. Refer to Operating Instructions "Adjusting Feed."
	Excessive tension	Tension blade to prevent slippage on drive wheel while cutting.
Blade line Run-out or Run-in	Wheels out of line	Adjust wheels
	Guides out of line	For a straight and true cut, realign guides, check bearings for wear.
	Excessive pressure	Conservative pressure assures long blade life and clean straight cuts.
	Support of blade insufficient	Move saw guides as close to work as possible.
	Material not properly secured in vise	Clamp material in vise, level and securely.
Blade twisting	Blade tension improper	Loosen or tighten tension on blade.
	Blade not in line with guide bearings	Check bearings for wear and alignment.
	Excessive blade pressure	Decrease pressure and blade tension
Premature tooth wear	Blade binding in cut	Decrease feed pressure
	Dry cutting	Use lubricant on all materials, except cast iron
	Blade too coarse	Use finer tooth blade
	Not enough feed	Increase feed so that blade does not ride in cut
	Excessive speed	Decrease speed

## SAWING PROBLEMS AND SOLUTIONS

Other than this manual, the manufacturer also provides some related technical documents listed as follows:

### Sawing Problems and Solutions

					Vibration during cutting	Failure to cut	Short life of saw blade	Curved cutting	Broken blade		
✓	✓	✓	✓	✓						Use of blade with incorrect pitch	Use blade with correct pitch suited to workpiece width
✓	✓	✓	✓	✓						Failure to break-in saw blade	Perform break-in operation
✓	✓	✓								Excessive saw blade speed	Reduce speed
			✓	✓						Insufficient saw blade speed	Increase speed
✓		✓	✓	✓						Excessive saw head descending speed	Reduce speed
✓		✓	✓							Insufficient saw head descending speed	Increase speed
		✓	✓							Insufficient saw blade tension	Increase tension
✓		✓	✓	✓						Wire brush improperly positioned	Relocate
✓		✓	✓							Blade improperly clamped by insert	Check and correct
✓	✓	✓	✓	✓						Improperly clamped workpiece	Check and correct
	✓	✓	✓							Excessively hard material surface	Soften material surface
		✓	✓	✓						Excessive cutting rate	Reduce cutting rate
	✓	✓								Non-annealed workpiece	Replace with suitable workpiece
✓		✓	✓	✓						Insufficient or lean cutting fluid	Add fluid or replace
✓		✓	✓	✓						Vibration near machine	Relocate machine
		✓	✓							Non-water soluble cutting fluid used	Replace
✓		✓	✓							Air in cylinder	Bleed air
✓		✓		✓						Broken back-up roller	Replace
✓	✓	✓	✓	✓						Use of non-specified saw blade	Replace
✓	✓	✓	✓	✓						Fluctuation of line voltage	Stabilize
✓		✓	✓							Adjustable blade guide too far from workpiece	Bring blade guide close to workpiece
✓		✓	✓	✓						Loose blade guide	Tighten
		✓		✓						Blue or purple saw chips	Reduce cutting rate
✓		✓		✓						Accumulation of chips at inserts	Clean
	✓									Reverse positioning of blade on machine	Reinstall
✓		✓	✓							Workpieces are not bundled properly	Re-bundle
✓		✓		✓						Back edge of blade touching wheel flange	Adjust wheel to obtain clearance
✓	✓	✓								Workpiece of insufficient diameter	Use other machine, suited for diameter of workpiece
	✓	✓	✓							Saw blade teeth worn	Replace

## RE-ADJUSTING THE ROLLER TABLE

If the feeding table suffers the huge stroke and the alignment is effected, follow the below procedure to adjust.

### TOOL, measuring

Measurement, Horizontal balance

### Procedure

1. Screw or loosen the adjusting bolt to attain the horizontal balance (leveling) between the roller table and the machine frame.
2. Ensure that the machine frame is not struck by the loaded material on the feeding table.
3. Check the leveling by the measuring tool.
4. After finished the adjusting, fix the roller table.



**If the feeding table and the machine frame are not positioned under the horizontal balance, the loaded material may be going up gradually and affect the cutting effect.**

# Warranty

## Warranty

New machines are warranted to be free from defects in workmanship and material for a period of one (1) year from the date of shipment by Seller. The warranty period is based on normal usage of two thousand eighty hours (2080) per year and is reduced proportionately for any excess usage. Products, which under normal operating conditions in Buyer's plant are defective in workmanship or material, will be repaired or replaced at the option of Seller.

This warranty does not cover shipping freight charges for either the return of the defective part or for the shipping of the replacement or repaired part.

Seller will have no obligation to repair or replace perishable parts, or materials or parts damaged by misuse, negligence or failure of Buyer to provide appropriate maintenance and service as stated in the operator's manual or industry standard and normally acceptable practices.

This warranty does not apply if the machine has been altered or modified without our prior written consent.

In the case of components or units purchased by Seller including work holding devices, tool holders, motors and controls, the warranty shall not exceed that received by Seller from the supplier of such components or units.

Seller will not assume responsibility for products or components returned to Seller without prior consent or for unauthorized repairs to its products, even though defective.

**Electrical Equipment:** The warranty available for all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

**Accessories Supplied with Manufacturer's Equipment:** The warranties available to the Buyer are those extended by the accessory manufacturer, if any, to the extent they are in force and effect. The ACCESSORY MANUFACTURER'S WARRANTY, if any, is exclusive and is in lieu of all other warranties whether written, oral or implied.

# PARTS

## SPARE PARTS RECOMMENDATIONS

### PART LIST

## SPARE PARTS RECOMMENDATIONS

The following table lists the common spare parts we suggest you purchase in advance:

<b>Part Name</b>	<b>Part Name</b>
Saw blade	Filter
Wire brush	Steel plates
Carbide inserts	Rollers
Bearings	Top Clamp
Chain	Pump
Asbestos	Belt
Washer	Chip conveyor
Gear reducer	Duster seal
Drive wheel	Idle wheel





Vertical Plate Saws  
Horizontal Billet Saws  
NC/CNC Band Saws  
Structural Miter-Cutting Saws  
Automatic Band Saws

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**COSEN MECHATRONICS CO., LTD.**