

HG-3216VR
Hydraulic Guillotine shears

Operation Manual

Serial No.: Q1503207

Contents

1、 Application of the Machine	-----	2
2、 Performance Parameters of Machine.	-----	3
3、 Structures of the Machine.	-----	4
4、 Hoisting and Installation	-----	6
5、 Adjustment and Operation of Machine	-----	8
5.1 Preparation before operation	-----	8
5.2 Run trial	-----	8
5.3 Single cut	-----	9
5.4 Continuous cut	-----	9
5.5 Adjustment of cutting angle	-----	9
5.6 Reset of cutting angle	-----	40
5.7 Fill oil	-----	10
6、 Hydraulic Driven System	-----	11
6.1 Cutting principle	-----	11
6.2 Valve position print	-----	11
6.3 Valve action print	-----	12
7、 Electric System of Machine	-----	13
7.1 General introduction	-----	13
7.2 Caution	-----	13
7.3 Electric principle chart	-----	14
7.4 Electric components list	-----	19
8、 Maintenance & Trouble Shooting	-----	21
8.1 Blades	-----	21
8.2 Lubrication of the machine	-----	22
8.3 Air pressure inspection of accumulator	-----	23
8.4 Maintenance of hydraulic system	-----	23
8.5 Maintenance of the machine	-----	24
9、 Packing List	-----	26

1. Application of the Machine

This machine suits the field of machinery, motors and electrics and light industry and etc. It is widely used in the straight cutting of various metal plates (with tensile strength less than $\sigma_b \leq 450\text{Mpa}$). With relatively small cut thickness and better knife, it can also cut the plates of low alloy steel, stainless steel, spring steel which is with strong tensile strength.

2、Performance Parameters of Machine (table 1)

No.	Item	Data	Unit	Notes
1	Max. Cutting Thickness	16	mm	
2	Max. Cutting Width	3200		
3	Shear angle	2° 30'	Degree	
4	Stroke times without load	6	Min-1	
5	Upper knife Holder Maximum Travel	180	Mm	
6	Maximum Cutting Force	600	KN	Including the return pressure
7	Maximum Clamping Pressure	350	KN	Vary as per the load
8	Maximum Working Pressure of Hydraulic System	20	MPa	
9	Adjustment Range of Back-gauge	10-1000	mm	
10	Table Height Above Floor	800	mm	
11	Main Motor	Model	Y160L-4B5	
		Power	15	kw
		Speed	1440	R/min
12	Oil Pump	Model	NT4-G40F	
		Flow	40	ml/r
		Pressure	31.5	Mpa
13	Overall Dimensions	Length	3950	mm
		Width	2350	
		Height	2450	
14	Machine Gross Weight	11000	kg	
15	oil capacity	350	L	

3、 Structure of the Machine

3.1 Frame: Welded steel construction with excellent rigidity and stability. The main parts consist of left and right support pillars, clamping board, a working table and oil tank. The two cylinders are mounted on the support board which connects the two support pillars and boards.

3.2 Upper knife beam: a triangle steel-sheet welded structure with guiding rail plate, blade and back-gauge device. The cutting operation is effected through reciprocation movement actuated by left and right cylinders.

3.3 Cylinders device on the left and right: It consists of two piston cylinders and sealing components. This device directly drives the movement of upper knife beam.

3.4 Hydraulic system: It consists of Main motor, oil pump, valve, oil tank, pipings and etc. It is the driving system of the machine.

3.5 Clamping device: Consists of many cylinders which are installed at the front of the machine frame. When oil enters the clamping cylinders, the clamping heads overcome the pull strength of the springs, press down, clamp the sheet to cut , then return to its original position with the help of spring force after cutting. The clamping strength increases as the plate thickness increases.

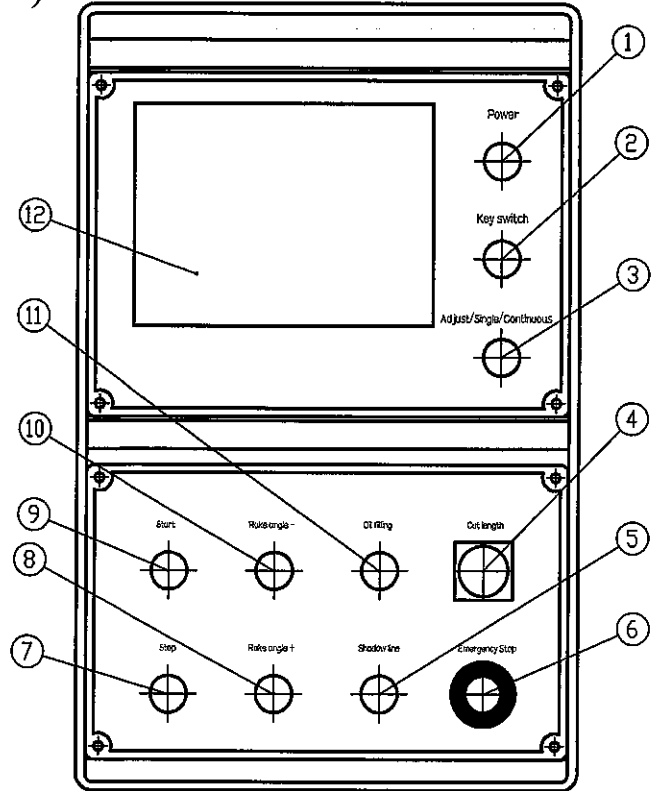
3.6 Blade gap adjustment device

It consists of adjustment handle, lever, dial and etc. The gap can be adjusted according to the plate thickness.

3.7 Electric system

It consists of electric box which is installed on the left support pillar and the buttons at the plate. This is for operation and control of the machine.

3.7.1 Panel fig of switchboard (chart 1)



NO.	Function explanation
1	Power indicator
2	Power switch
3	Adjusting\single cutting\continuous cutting switch
4	cutting stroke adjustment
5	Daylight lamp
6	emergency stop
7	Main motor stop
8	Cutting angle increase
9	Main motor start
10	Cutting angle decrease
11	Oil filling button
12	NC89

4、Hoisting and Installation

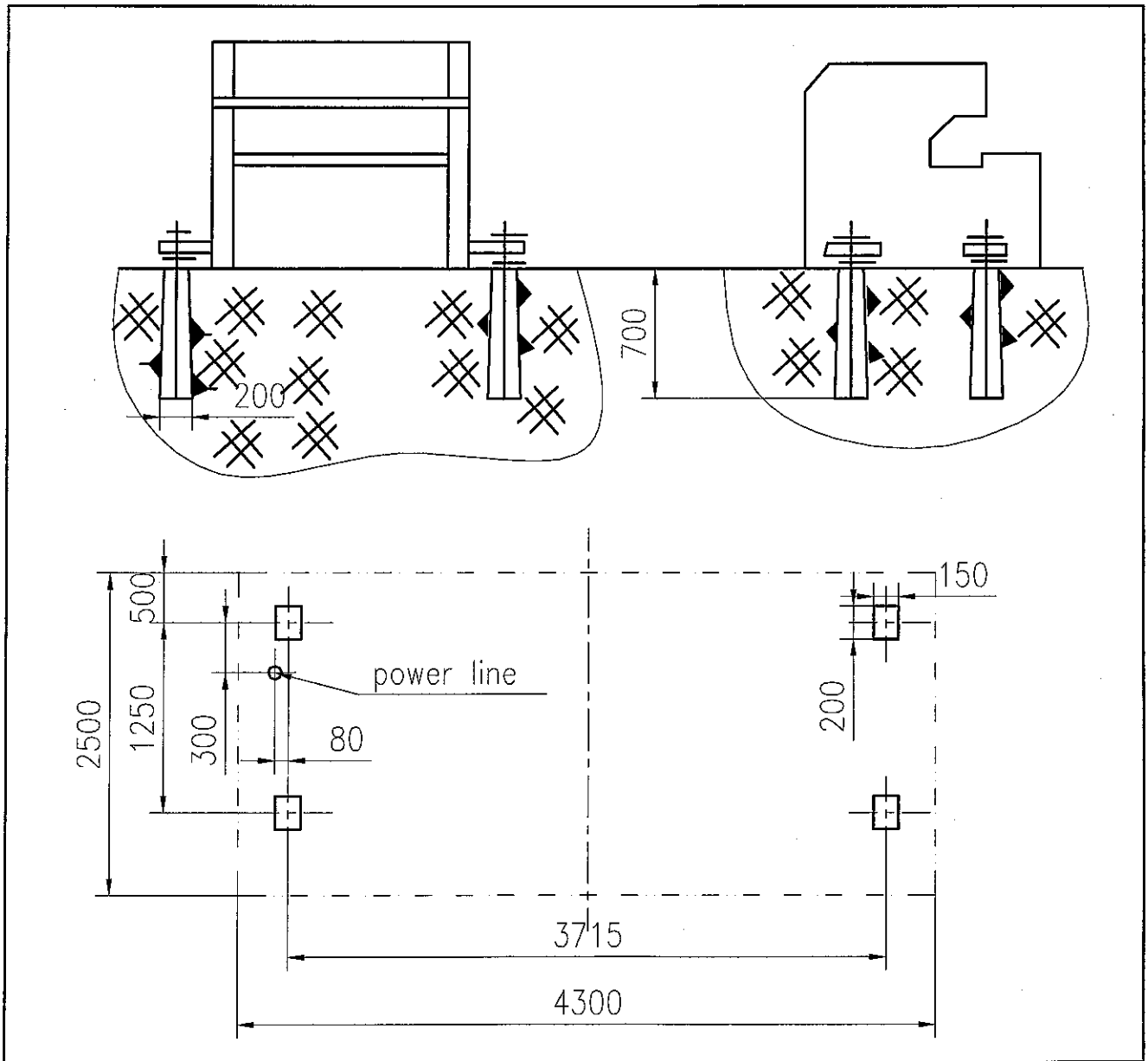
4.1. Hoisting

4.1.1 The machine has lift holes at the top for hoisting . Pls choose proper steel ropes and hoisting equipment as per the machine weight. Accidents will occur if the hoisting is not effected properly.

4.1.2 The basis of the machine

The earth around the basis should be solid , and the depth depends on the specific condition.

4.1.2.1 Basis draw (chart2)



4. 2 Installation of the machine

4.2.1 When installation , remove the balling cover on the worktable , and put the same height pad at the processing side. And put the IM ruler on the pad. And then use the lever meter to adjust vertically and horizontally , the allowance is less than 0.2mm every 1000mm length, the left and right direction should be same. The base depth for machine installation depends on the earth situation (but not less than 500mm.) The earth pouring work is done by twice(pls see the chart). After 15 days from the date of first pouring,put the machine on the base and adjust horizontally and then set the foot screws and adjust the pad iron and then make the second pouring. After 48 hours of that, adjust horizontally and tighten the foot screws.

5、 Adjustment and Operation of the Machine

5.1 Preparation before the operation

- A、 Clean the oil stains of the machine surface, inspect all bolts are tighten.
- B、 Fill the lubrication grease .
- C、 Clean and fill the Model L-HL 46 ordinary hydraulic oil into the oil tank.
- D、 The machine should be grounded , connect the power supply , the machine uses 420V/50HZ power.
- E、 Tighten all hydraulic pipe connecting nut.
- F、 before the delivery of the machine, the various valves have been locked properly and tightly. Pls do not adjust the handwheel freely to avoid abnormal action of the machine and avoid loss.
- G、 the air pressure of accumulator has been setted to 5~6 MPa before delivery, need not to adjust unless you have special situation

5.2 Run Trial

- A、 Power on and turn the power switch to “1 ”.
- B、 Push the motor button , and start the main motor. Inspect the motor(use the same axis with oil pump) and make sure that the motor rotation direction should conform to the oil pump marked direction. If not conformed, pls change the input phase . But do not change the inner connection. When conformed, start main motor.
- C、 Because the knife beam is on the bottom dead point, pls reset it.
 - 1) Turn the switch on the penal to adjust function
 - 2) Press oil filling button and angle increase button meantime, adjust the filling pressure to 16~18 MPa and keep 2~3 seconds.

3) Loose the angle increase button first, then loose oil filling button, knife beam return.

4) Turn the switch on the penal to cutting function

D、 Turn the hand wheel according to the plate thickness and adjust the blade clearance

E、 Adjust the back gauge distance according to the plate length.

F、 After above action is finished, then Stamp the foot switch and start the cutting.

G、 Push the red button “EMERGENCY STOP” when machine is abnormal or when you want to stop the machine.

H、 After the machine is tested fine under both no load operation and load operation, then you can make the machine into formal production. If find the machine is abnormal, you will have to correct the problems and then put into production.

5.3 Single cutting

Turn the switch on the penal to single cutting mode, then stamp the foot switch, the knife beam moves down and starts to cut. The cutting is finished when moves to the lower limit SQ3 or when you release the foot switch. After complete the cutting stroke, the machine will automatically moves up until it is up to the upper limit SQ4 . If the plate is not cut off completely, pls do not release the foot switch to avoid the hurt of plate.

5.4 Continuous cutting

Turn the switch on the penal to Continuous cutting mode, stamp the foot switch and press the pump start button at the same time, then loose them, The knife beam will automatically repeat the action of single mode until that times are up or switch is turned off . Anyway we do not encourage customers to use this mode as the

machine runs quickly and sometimes may hurt the plate or accident occurs.

5.5 Adjustment of cutting angle

Turn the switch to adjust mode, press the angle decrease or increase button to decrease or increase cutting angle; after adjustment, turn the switch to cutting mode.

5.6 Reset of cutting angle(oil compensation of the series oil circuit)

The cutting angle is set up to be 2.5 degree originally. After many times angle adjustment, 2.5 degree maybe not obtainable, and in this situation the angle can be recovered back to 2.5 degree. (This item also suits the oil compensation of the series oil circuit). The procedure is as below: turn the switch to adjust mode, push the oil filling button , then push the angle increase button. When the knife beam moves down to the dead point, hold on the button for a few seconds and then release the angle increase button , then release the oil filling button . After adjustment is finished, turn the switch to cutting mode.

5.7 Oil filling

When the machine have been operated for a period of time, the return pressure may be consumed a lot, in this situation the knife beam can not return to the dead point, so we will have to fill the oil in this case. Oil filling procedures as below: turn the button on the panel to adjust mode, push the oil filling button, the knife beam moves down to the dead point, , adjust the overflow valve up to pressure around 16~18Mpa, the pressure will be displayed by pressure meter(17). When filling is finished, turn the button on the panel to cutting mode.

6、 Hydraulic Driven System

6.1 Cutting principle:

When stamp the foot switch, YV1 is electrified, the route to oil tank via overflow is closed. The output oil will enter into upper cavity of no. 12 cylinder , oil of the lower cavity of no.12 will enter into upper cavity of no.11 cylinder. The oil of lower cavity of no.11 cylinder will enter into accumulator 10, in this way it forms series route. The other route is: the oil enters into clamping cylinder 8 via ball valve 7. Then the clamping cylinder moves downward and hold down the plate. During the continuous increased oil pressure, the knife beam moves downward by overcoming the supporting force of lower cavity of no. 11 cylinder. And in this way the cutting action is achieved . At same time, the oil route working pressure is controlled by overflow valve 5. The pressure set up by manufacturer is 18 Mpa (nominal pressure). The pressure data will be readable from pressure meter 6. When the cutting is finished, The electromagnetic valve is power off, the oil from pump will return to oil tank via overflow valve 5. The knife beam returns back under the function of accumulator. , the clamping cylinder is returned by the spring force. Then the whole cutting performance is finished.

6. 2、 valve position print(chart 3)

overflow valve(5)

main pressure meter(6)

electromagnetic valve for filling (14)

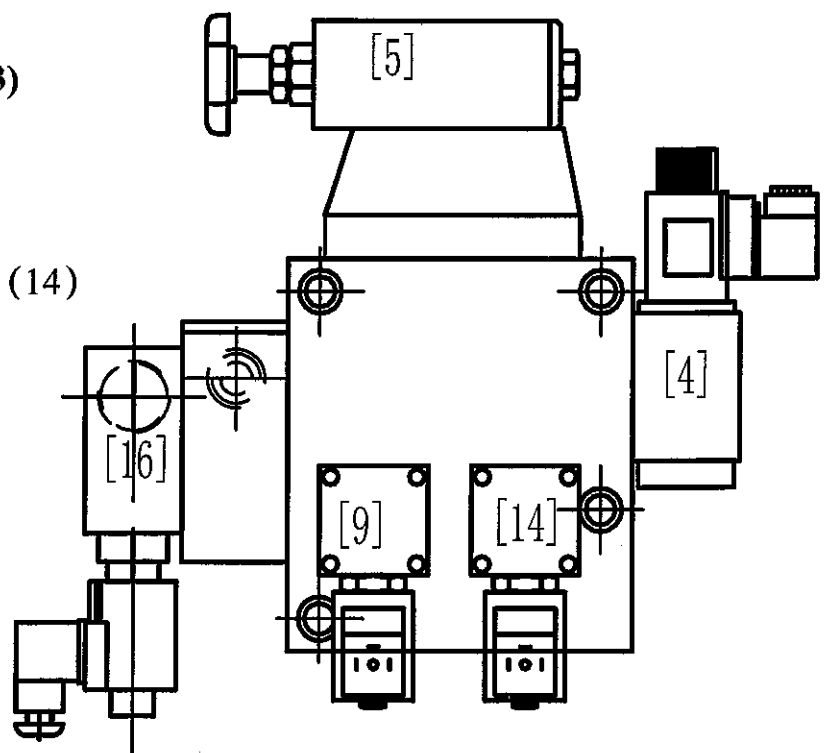
electromagnetic valve(4)

pressure meter for return(17)

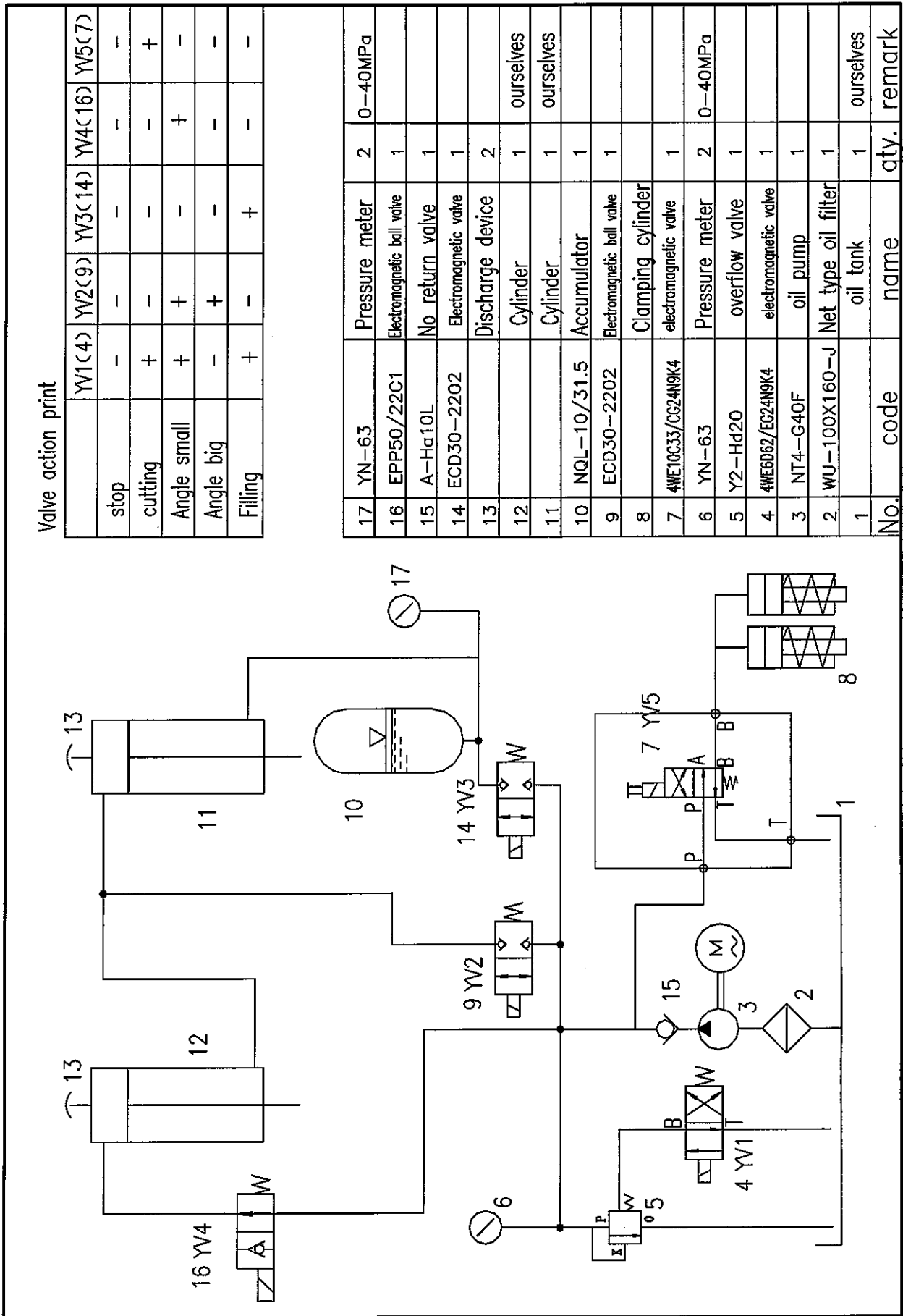
electromagnetic valve for cutting

angle adjustment (9)

electromagnetic valve (16)



6.3 Hydraulic principle print(chart 4)



7、 Electric System of Machine

7.1 **General introduction:**

The machine adopts the three-phase 420V power supply. 24V to A.C. control circuit; 27V and then 24V to D.C. Light power is AC 220V; output of the transformer is supplied to control circuit. The machine connects the ground safely. The electric components of the machine are mainly installed inside the electric box and control panel. Pls refer to our electric components list for introduction of these components.

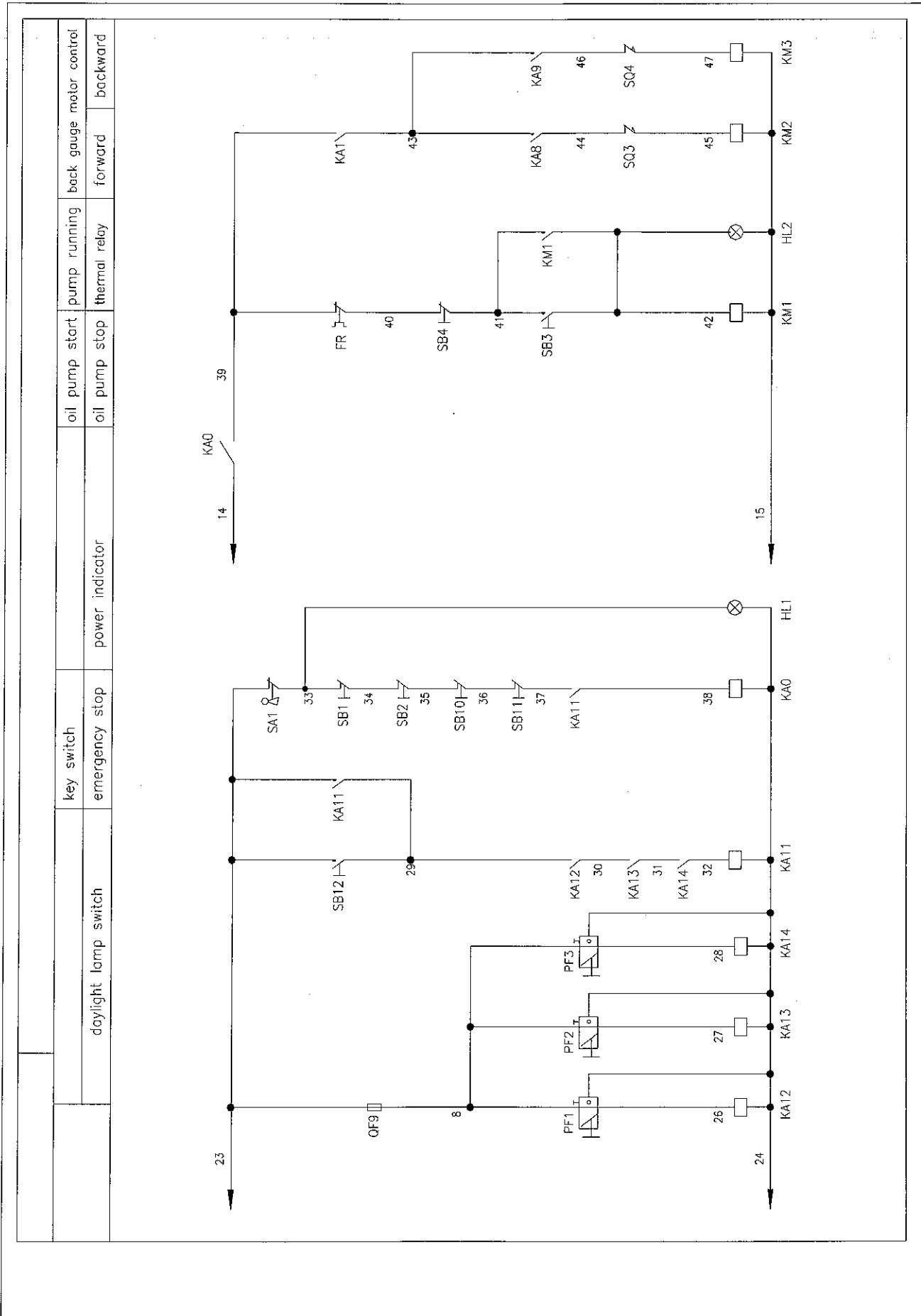
7.2 Caution:

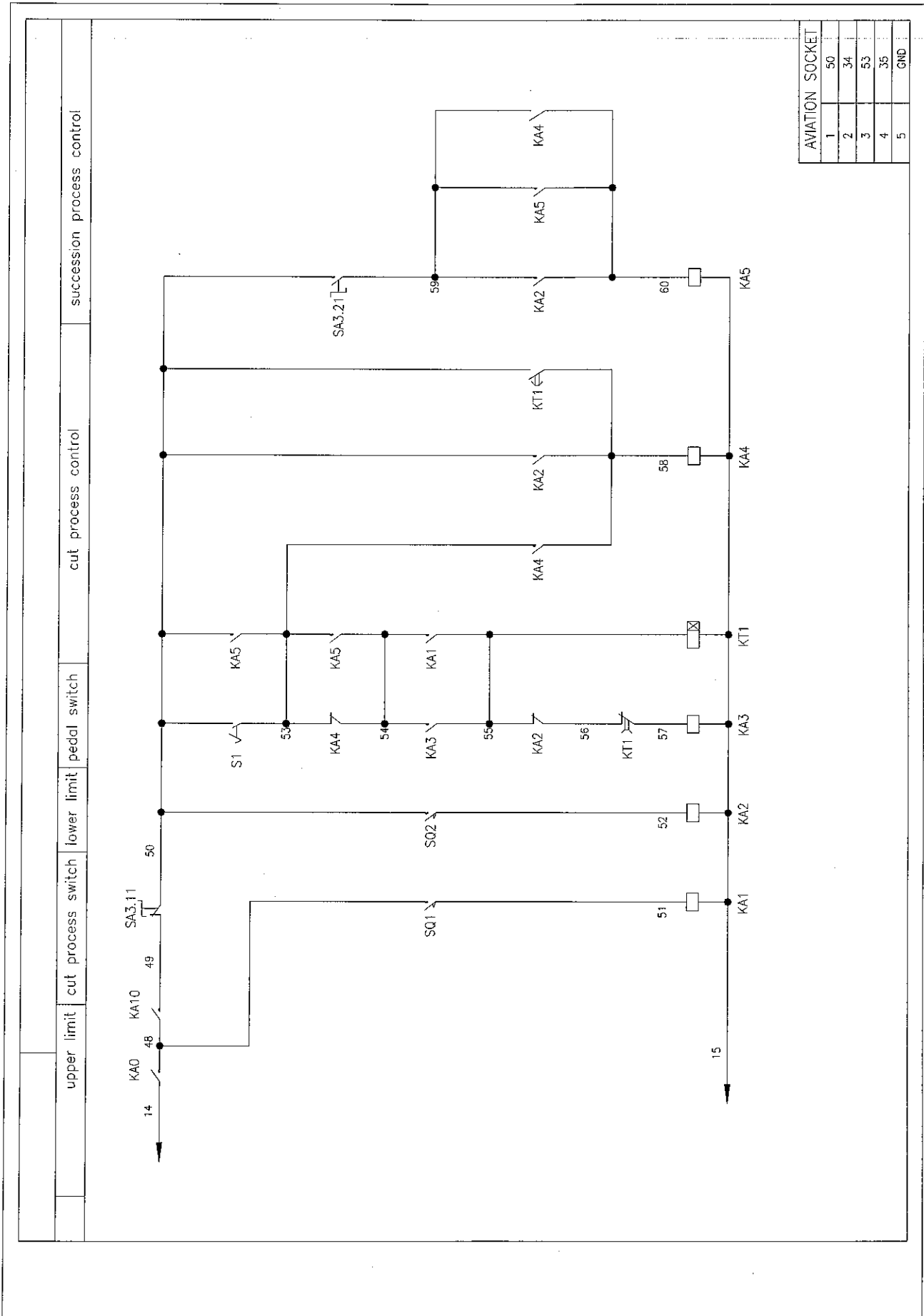
7.2.1 This machine is special tool, so users should arrange special operators. The operators should read this operation manual very carefully and receive training by our plant. Operators can run this machine only under approval of our technicians by training. People without training can not run this machine to avoid loss and hurt.

7.2.2 Operator should lock the SA1 key button and turn off the power switch at the electric box when leaves . Make sure the machine is power off when no operator. The machine should be grounded properly.

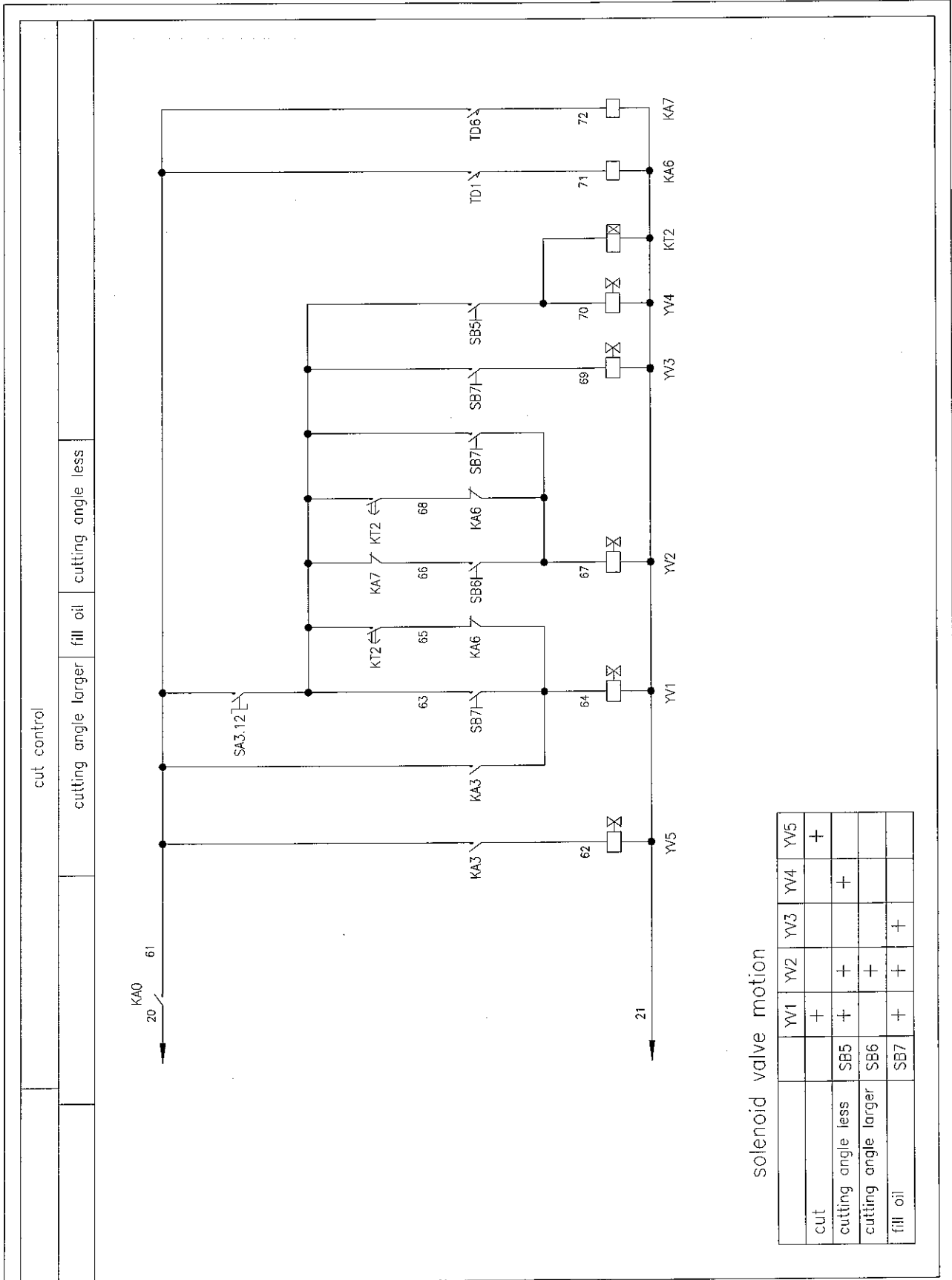
7.3 Electric principle print(refer to chart 5)

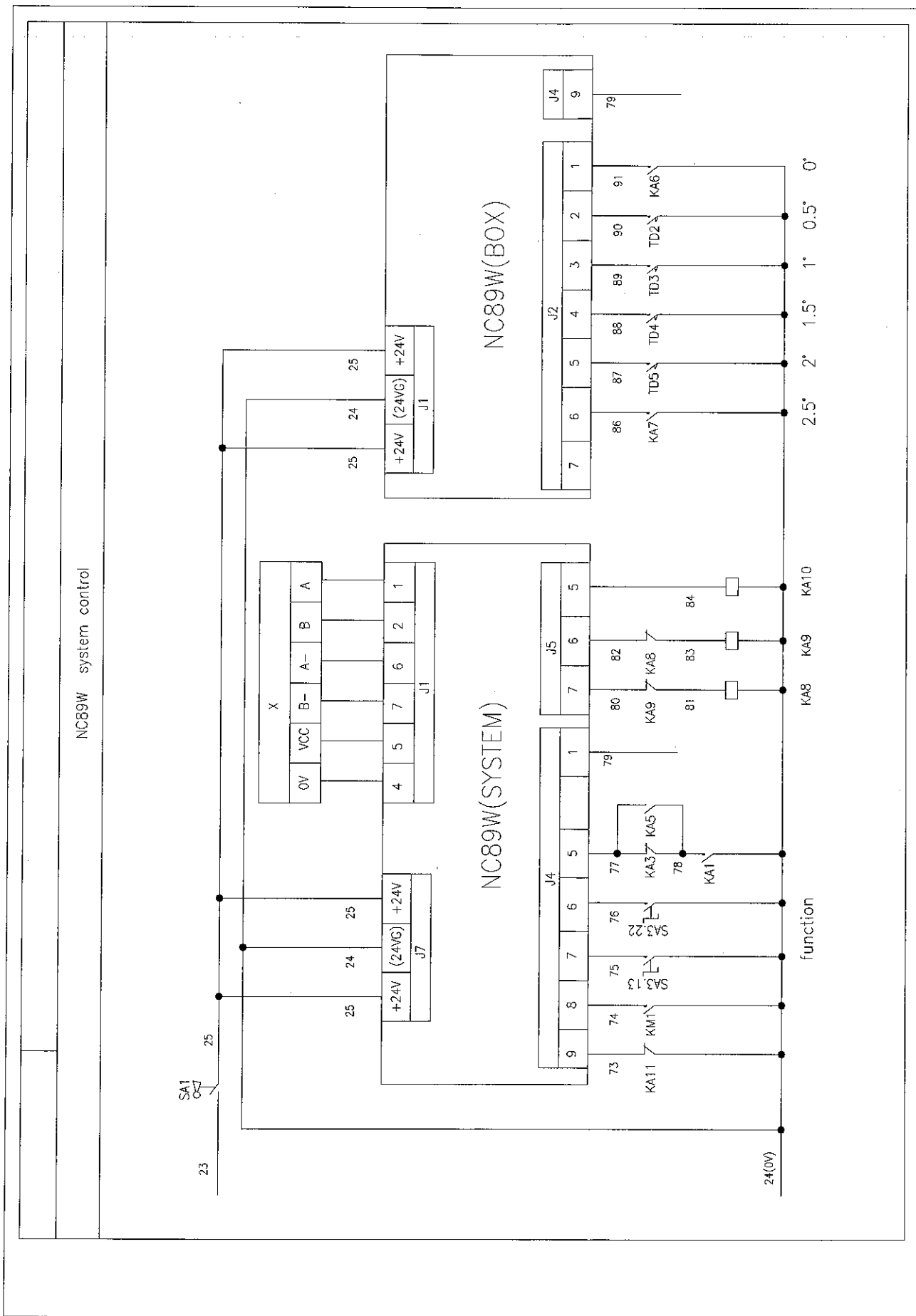
7.4 Electric components list (refer to table 2)





AVIATION SOCKET	
1	50
2	34
3	53
4	35
5	GND





Electric components list(table 2)

SYMBOL	NAME	TYPE	QTY	REMARK
KM1	CONTACTOR	LC1-D3210B7	1	FOR MOTOR
KM2,KM3	CONTACTOR	LC1-D0910B7	2	BACK GAUGE MOTOR
FR	THERMAL OVERLOAD RELAY	LRD-13	1	FOR MOTOR
QF0	CIRCUIT-BREAKER	S1N100 63A	1	
QF1	CIRCUIT-BREAKER	C65N D63A/3P	1	FOR MOTOR
QF2	CIRCUIT-BREAKER	C65N D4A/3P	1	BACK GAUGE MOTOR
QF3	CIRCUIT-BREAKER	C65N C6A/2P	1	FOR CONTROL SYSTEM
QF4	CIRCUIT-BREAKER	C65N C6A/1P	1	AC24V POWER
QF5	CIRCUIT-BREAKER	C65N C6A/1P	1	FOR CONTROL SYSTEM
QF6	CIRCUIT-BREAKER	C65N C6A/1P	1	FOR VALVE
QF7	CIRCUIT-BREAKER	C65N C6A/1P	1	FOR SYSTEM
QF8	CIRCUIT-BREAKER	C65N C1A/1P	1	FOR LAMP
QF9	CIRCUIT-BREAKER	C65N C1A/1P	1	PHOTO SENSOR
KA1-KA5	RELAY	RXM4AB2B7	5	FOR CONTROL SYSTEM
SB5,SB6	BUTTON	XB2BA21C	2	FOR CUTTING ANGER
SA2	BUTTON	XB2BD21C	1	FOR LAMP
SA3	BUTTON	XB2BG33C	1	FOR CONTROL SYSTEM
SA1	BUTTON	XB2BG21C	1	FOR CONTROL SYSTEM

Hydraulic Guillotine Shear

SB1,SB2,S B10,SB11	BUTTON	XB2BT42C	4	EMERGENCY STOP
SB4	BUTTON	XB2BW33B1C	1	FOR MOTOR STOP
SB3+HL2	BUTTON	XB2BA42C	1	FOR MOTOR START
SB7	BUTTON	XB2BA31C	1	FILL OIL
HL1	LAMP	XB2BVB1C	1	FOR POWER SUPPLY
KT1	TIMER RELAY	H3CR-A8	1	CUTTING LENQTH
KT2	TIMER RELAY	ST3PA-Y	1	ADJUSTIVE
VE1	POWER SUPPLY	S-200-24	1	FOR VALVE
VE2	POWER SUPPLY	S-35-24	1	FOR CONTROL SYSTEM
TC1	TRANSFORMER	JBK5-500VA	1	
	CONTROL SYSTEM	NC89	1	
PF1-PF3		E3ZS-T81A	3	PHOTO SENSOR
KA0 KA6-KA1 1	RELAY	RXM4AB2BD	7	FOR CONTROL SYSTEM
KA12-KA 14	RELAY	RXM2AB2BD	3	FOR CONTROL SYSTEM

8、 Maintenance & Trouble Shooting

8.1 Blades

8.1.1 The blade clearance (blade gap) adjustment:

It is a very important factor to adjust the blade clearance which relates the cutting quality and knife life. Pls follow below procedures: the clearance data is 0.07~0.10 times of the plate thickness, the plate thickness =0.07~0.10 t. The above is for specific elongation $\delta = 0.21$. For more than 0.21, it is suggested to use smaller clearance. And for less than 0.21, pls use larger clearance. Turn the handwheel in the front of the plane board to adjust the clearance data. That means adjust the clearance according to the plate thickness. The data will be displayed on the handwheel

8.1.2 measuring of blade clearance and adjustment of the proportional clearance

the proportional clearance relates the cutting quality directly. It is set up by the manufacturing and unnecessary to modify normally. After the machine has been used for a period of time and if the knife side is changed, then it is a must to adjust the blade clearance again . The adjustment procedure is as below: turn the switch to adjust mode, adjust knife beam to balance(cutting angle is 0, Turn the clearance adjust hand wheel anticlockwise to the “smallest clearance”, turn off main motor(power on), press oil filling button, move knife beam down until distance between upper and bottom blades is 3~5mm, adjust the bolts and nut which support bottom blade on work table, use the plug gauge to inspect the clearance. After the adjustment is finished, repeat reset course of knife beam(5.2.C).

8.1.3 The installation of the blade

After the machine has been used for a period of time, must turn over the blade sides or change the blade. The installation of the upper blade is as below: make the upper knife beam flat(the cutting angle is 0). Then turn off the screw at the lower knife to change the blade or turn over the blade. (be careful of the sharp blade to avoid hurt.) it is easier to change the lower blade. Just take off the upper blade cover at the working table and turn off the screw to change the blade or turn over the blade.

8.1.4 The grinding and change of the blades

The blades need to be ground timely. And It is costly if do not grind the blades timely. If the blade is not sharp enough, the blade will be hurt due to too much pressure in cutting and the cutting quality will be affected. So pls make up a complete blade grinding timeline according to the production status. It is recommended to have some spare blades for replacement at any time.

Our recommended blade grinding timeline:

(1) For operation 80-100hours, pls turn over the blade sides. The upper blades and the lower blades can be turned over three times.

(2) For operation 320-400 hours, pls grind the blade. For most severe damaged blade, pls change the blade. After the blade grinding or when new blade is used, the blade clearance needs to be reinspected and readjusted.

8.2 Lubrication of the machine

Good lubrication is a must for the proper machine operation and long machine life. Pls make good lubrication as per our provided procedures.

The main areas for lubrication:

- A、 The guiding rod and thread rod of the back gauge. Lubricate it once a week.
(clean the thread rod off the dirt and oil stains.)
- B、 3 rolled guiding rails. Lubricate it every day for the initial stage of machine running.
- C、 For the spare parts outside and the rolled bearings, pls lubricate it twice a week.

And pls inspect and clean the lubrication system frequently and take good care of them.

8.3 The air pressure inspection of accumulator(the air pressure has been setted to 5~6 MPa before delivery, need not to adjust unless you have special situation)

When the upper knife beam returns slowly(the oil pressure is proper), pls inspect the air pressure of accumulator. The inspection way is as below: Make the machine power on, and do not start the main motor, turn the switch to adjust mode and push the oil filling button, discharge the return oil pressure and then the upper knife beam will move down to the dead center. Inspect the nitrogen pressure by accumulator nitrogen tool. If the nitrogen pressure is less than 5~6 Mpa, pls fill in. After inspection and the filling, pls follow up the oil filling procedures (5.7)

CAUTION: ONLY FILL IN THE NITROGEN INSIDE THE ACCUMULATOR, OTHERS ARE STRICTLY PROHIBITTED

8.4 The maintenance of the hydraulic system

8.4.1 The return lines(return circuit) of hydraulic system

- 1) check the oil level of the oil tank. If the oil level is less than the middle line, pls fill in the oil immediately up to the middle line.
- 2) After the machine has been run for one month, pls change the oil for the first time.
- 3) Pls change the oil every 2000 hours of operation.
- 4) The hydraulic oil should be qualified and the viscosity is 27-33.
- 5) Pls clean the oil tank thoroughly for every oil changing

8.4.2 Oil filter

- 1) Use gasoline or other solution to clean the oil filter. Pls refer to below timeline to clean the filter: Clean the filter first time after 8 days of machine formal operation. And later clean the filter every 30 days of operation.
- 2) Pls change the components of filter if they are found to be damaged.

8. 4. 3 Air filter

- 1) The air filter is installed at the oil tank.
- 2) Pls clean the filter first time after 500 hours of machine formal operation. Use gasoline or chloroethylene or other solution to clean it. And clean the filter every 1000 hours of operation.

8. 4. 4 Hydraulic pump

Pls refer to relevant technical data of hydraulic pump.

8. 4. 5 The inspection of the mechanical parts:

Pls check the fittings once a week for the tightness and also check the lubrication situation. If find any abnormal things, pls correct it immediately before operation.

8. 4. 6 Adjustment of safety overflow valve

The overflow adjustment is very important for normal operation of the machine. Pls adjust it as per the maximum working pressure. If it is found that the machine is damaged due to that the pressure adjusted data exceeds the maximum data, the manufacturer will not be responsible for this kind of problems or loss occurred due to incorrect adjustment.

8.5 The Maitenance of the Machine

- 1). Operator should be familiar with the construction and characteristics of the machine .The machine is operated by several operators simultaneously , so should arrange special person to be in charge of the production .
- 2). Never put the hand within the upper and lower blades to avoid hurt.
- 3). To prevent accident due to tools and dirty things between knives , there're should no tools and dirty things on the worktable .
- 4). You should period check the sharpness of knives , if they become blunt ,you should grind or change at once . To grind the knives you should only grind the thickness and ensure the thickness of one set knife are same .
- 5). You should period check each part of machine , maintain the cleanness of the machine and surround environment and the good insulation of wire .

6. To maintain filter in good condition , you should often check and clean the filter mounted on the suction port of pump . If the filter not in good condition , it will effect the life of pump .

7 **Only fill in the nitrogen inside the nitrogen bag of accumulator.(oxygen is prohibited strictly0)**. Pls fill in the nitrogen slowly to avoid t he breaking of the bag.

8. To avoid oil leakage, pls tighten the screws at the piping connection after 25 hours of operation initially. Pls tighten the screws again every 200 hours after formal production.

9、 Packing List

No	Item	Specification	quantity
1	Foundation Bolt	M20X500	4
2	Manual oil gun	Oil supply 1 cubic mm	1
3	Nitrogen fill tool		1
4	Operation manual		1
5	Quality Certificate		1
6	Foot switch	YDT1-12	1
7	Spanner		1
8	O-Ring	16X2.4	2
9	O-Ring	45X3.1	2
10	O-Ring	70X3.1	2
11	O-Ring	40X3.1	2
12	O-Ring	65X3.1	2
13	O-Ring	40X3.5	5
14	O-Ring	55X3.1	5
15	Pad	14	5
16	Pad	33	5
17	Pad	42	5
18	ferrule	10	5
19	ferrule	28	5
20	ferrule	34	5