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S961

**3200 X 12MM MOTOR. VARI -RAKE
GUILLO**

**OPERATION & MAINTENANCE
MANUAL**

02-09-09

QC11Y-12X3200
Hydraulic Guillotine shears

Operation Manual

Serial No.: _____

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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		12	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		160	Mm	
6	Maximum Cutting Force		433	KN	Including the return pressure
7	Maximum Clamping Pressure		230	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	NT3-G25F		
		Flow	25	ml/r	
		Pressure	31.5	Mpa	
13	Overall Dimensions	Length	4085	mm	
		Width	1900		
		Height	2230		
14	Machine Gross Weight		9800	kg	

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.

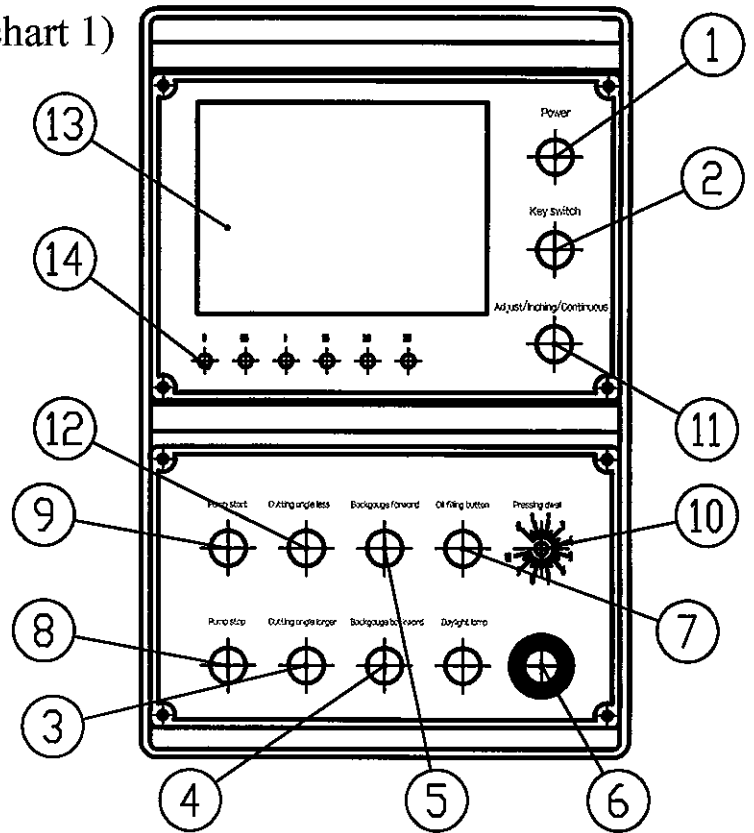
3.6 Blade gap adjustment device

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	Cutting angle increase
4	Back gauge distance decrease
5	Back gauge distance increase
6	emergency stop
7	Oil filling button
8	Main motor stop
9	Main motor start
10	cutting stroke adjustment
11	Adjusting\single cutting\continuous cutting switch
12	Cutting angle decrease
13	Back gauge value displayer (E10)
14	Cutting angle position indicator

4、Hoisting and Installation

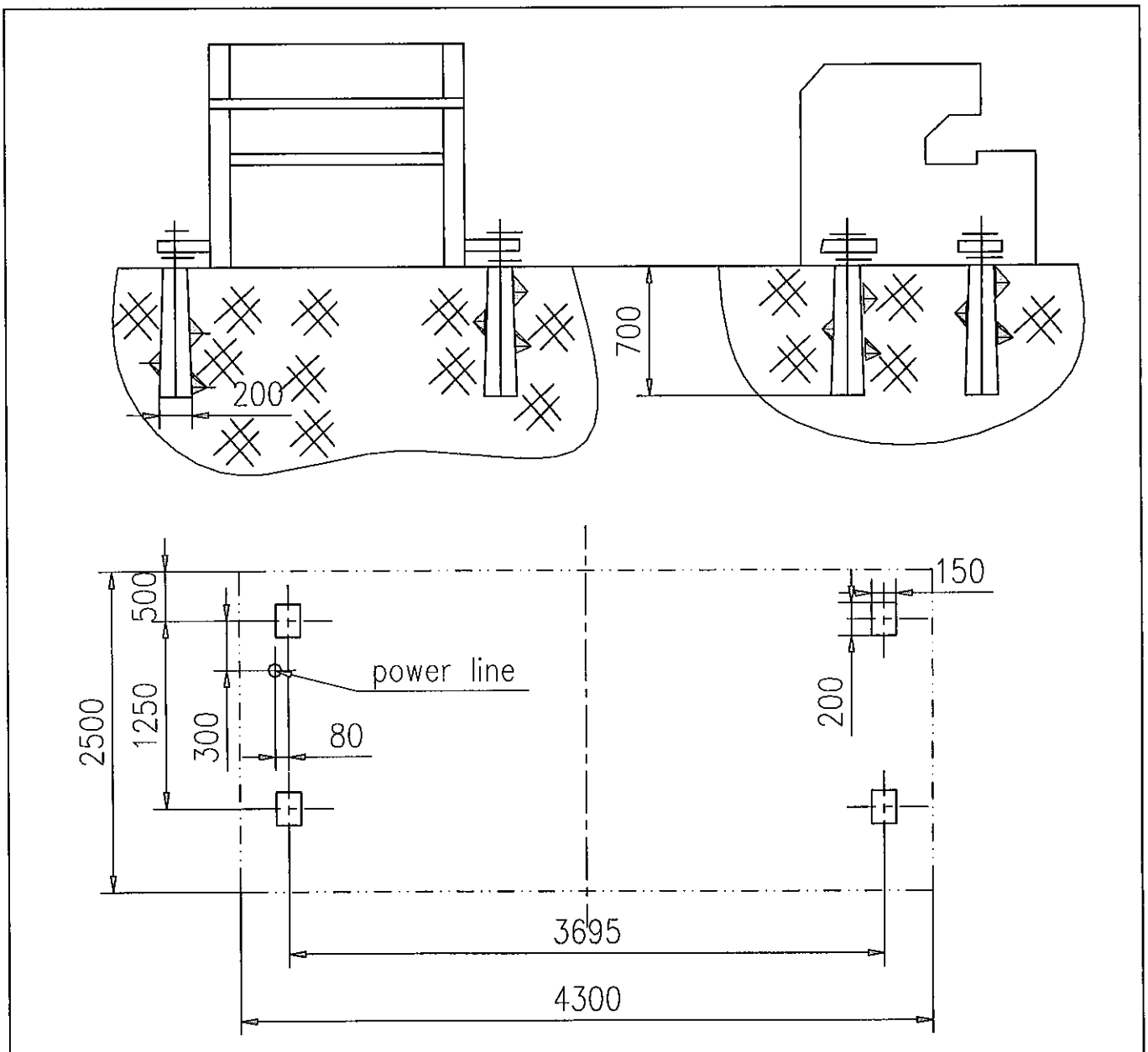
4.1. Hoisting

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 415V/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, stamp the foot switch , 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 foot switch . 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)

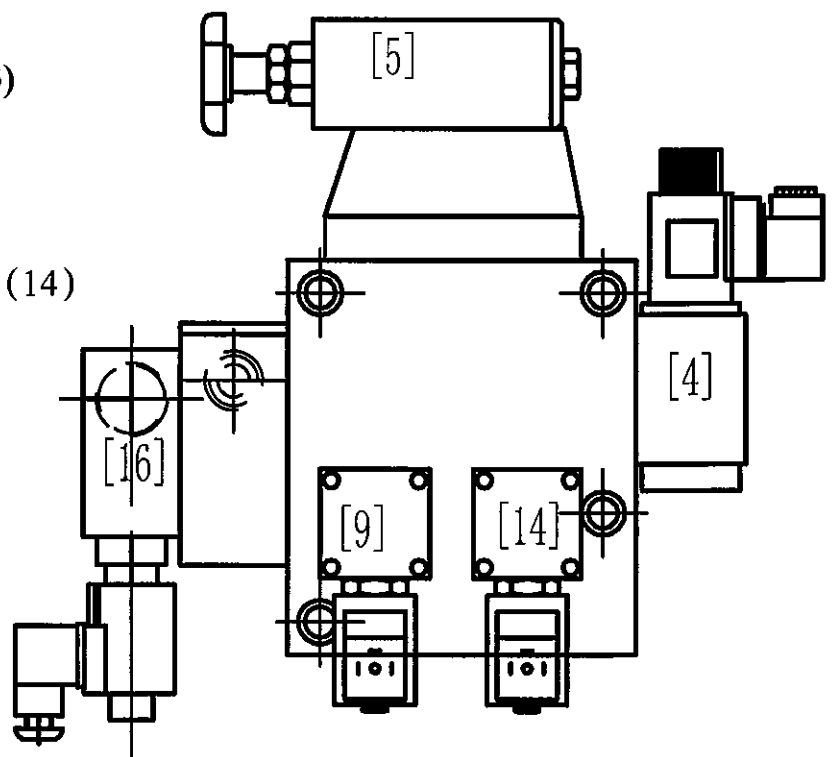
electromagnetic valve(4)

pressure meter for return(17)

electromagnetic valve for cutting

angle adjustment (9)

electromagnetic valve (16)

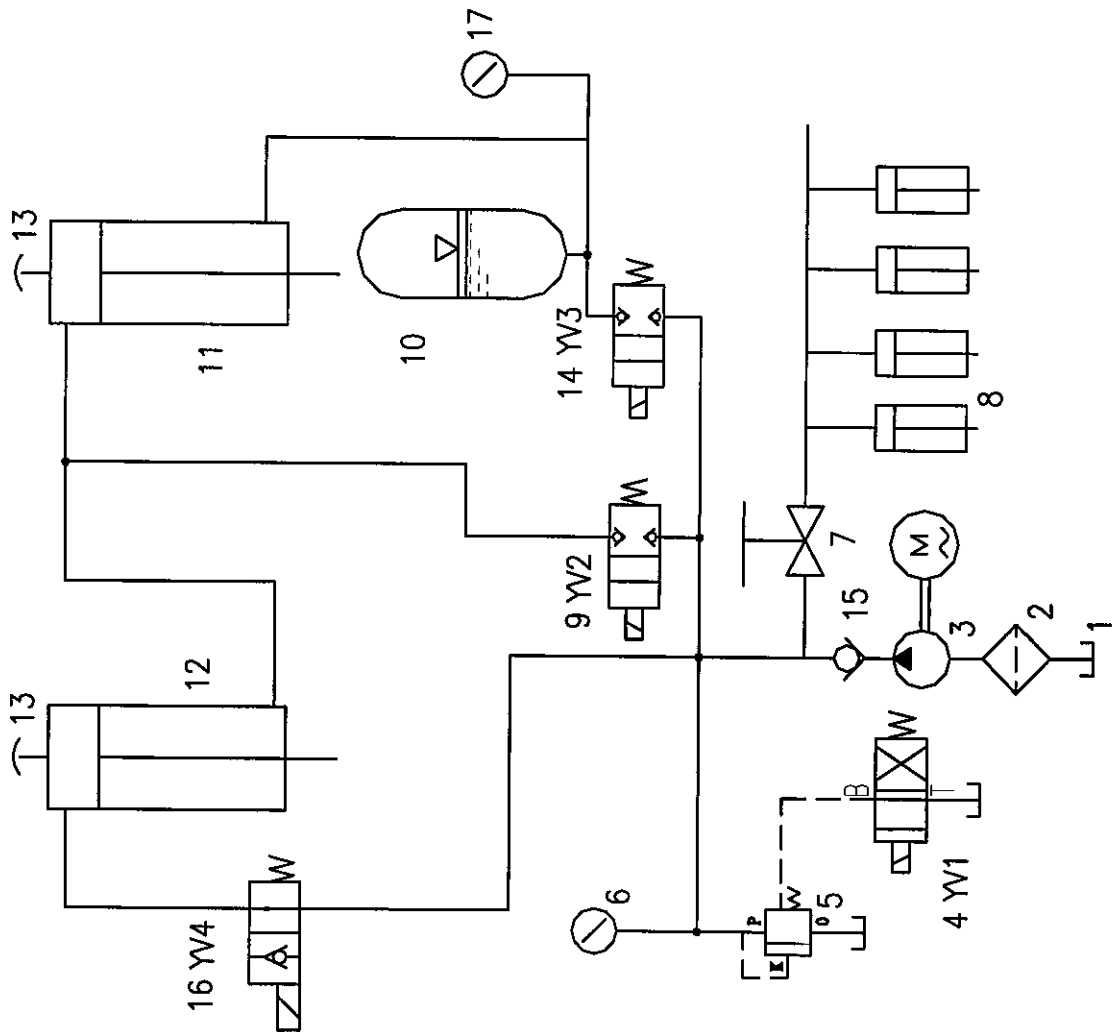


6.3 Hydraulic principle print(chart 4)

Valve action print

	YW1(4)	YW2(9)	YW3(14)	YW4(16)
stop	-	-	-	-
cutting	+	-	-	-
Angle small	+	+	-	+
Angle big	-	+	-	-
Filling	+	-	+	-

No.	code	name	qty.	remark
17	YN-63	Pressure meter	2	0-40MPa
16	EPP50/22C1	Electromagnetic ball valve	1	
15	A-Ha10L	No return valve	1	
14	ECD30-2202	Electromagnetic valve	1	
13		Discharge device	2	
12		Cylinder	1	ourselves
11		Cylinder	1	ourselves
10	NQL-10/31.5	Accumulator	1	
9	ECD30-2202	Electromagnetic ball valve	1	
8		Clamping cylinder		
7	CJZQ-H15L	Ball valve	1	
6	YN-63	Pressure meter	2	0-40MPa
5	Y2-Hd20	overflow valve	1	
4	SMH-GD2-B2-D24-20	electromagnetic valve	1	
3	NT3-G25F	oil pump	1	
2	WU-100X160-J	Net type oil filter	1	
1		oil tank	1	ourselves



7、 Electric System of Machine

7.1 **General introduction:**

The machine adopts the three-phase 415V 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:

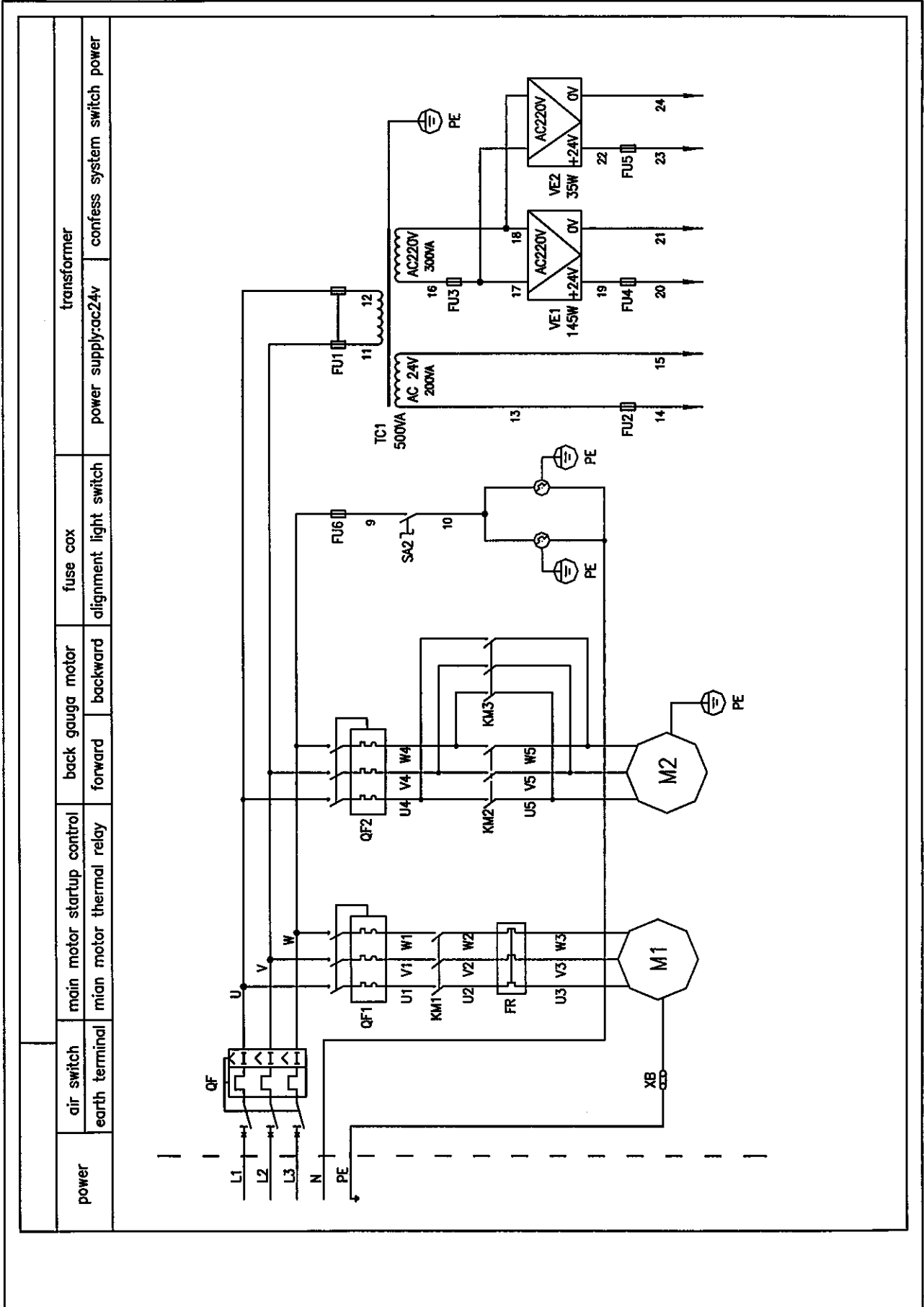
7.2.1 This machine is special tool, so users should arrange special operators. The operators should read this operation manual very carefully and receive training by our plant. Operators can run this machine only under approval of our technicians by training. People without training can not run this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

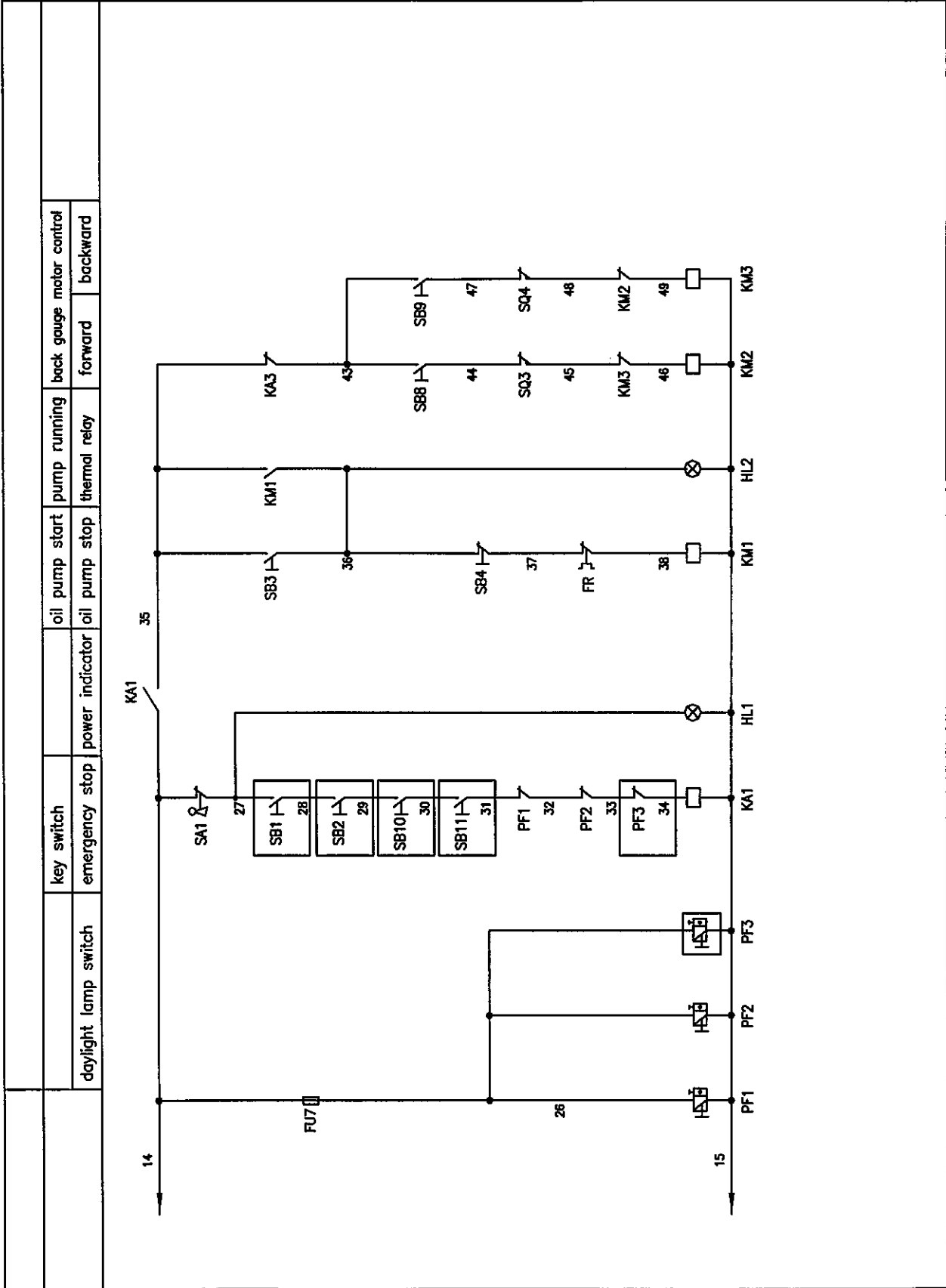
7.2.2 Operator should lock the SA1 key button and turn off the power switch at the electric box when leaves . Make sure the machine is power off when no operator. The machine should be grounded properly.

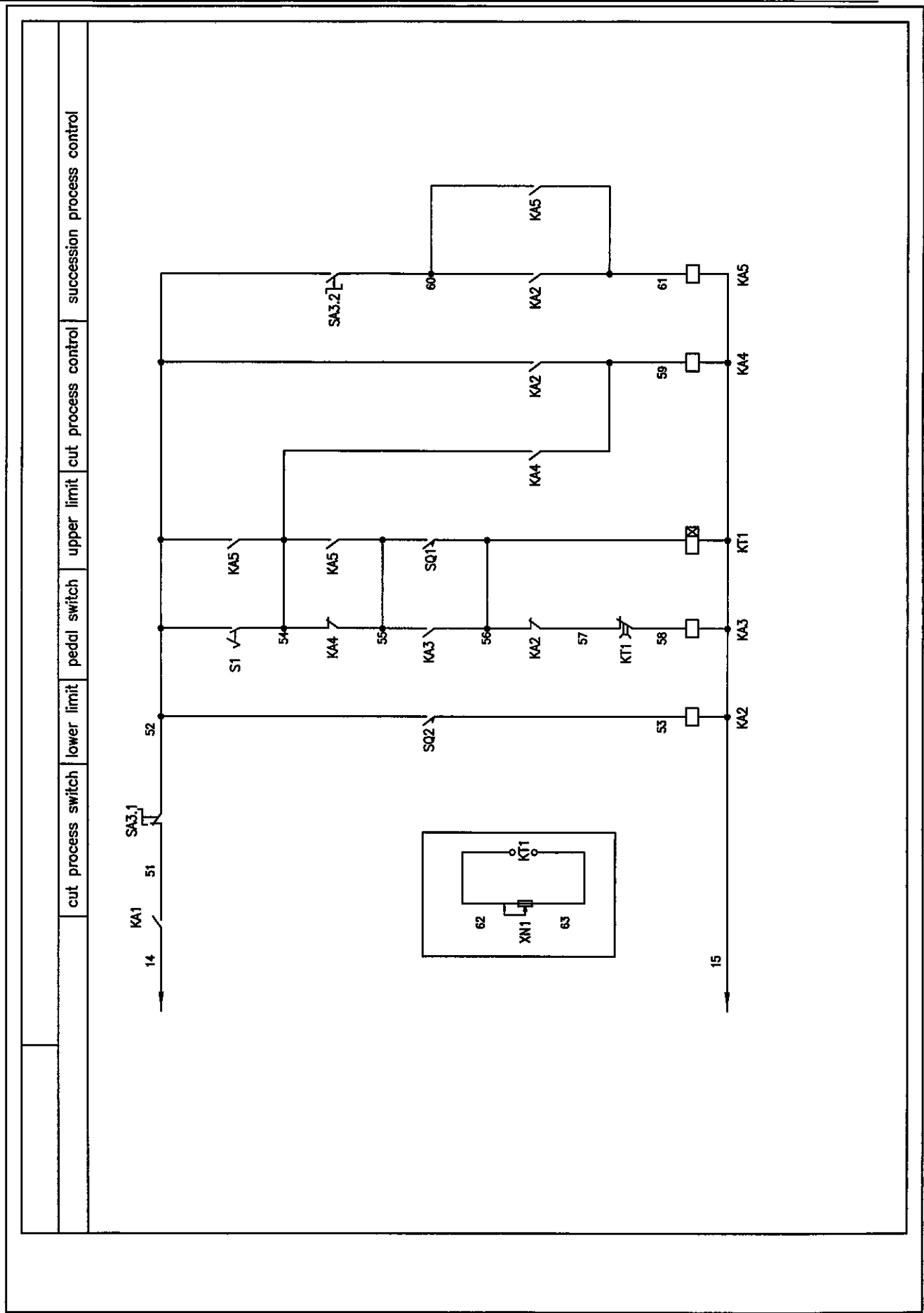
7.3 Electric principle print(refer to chart 5)

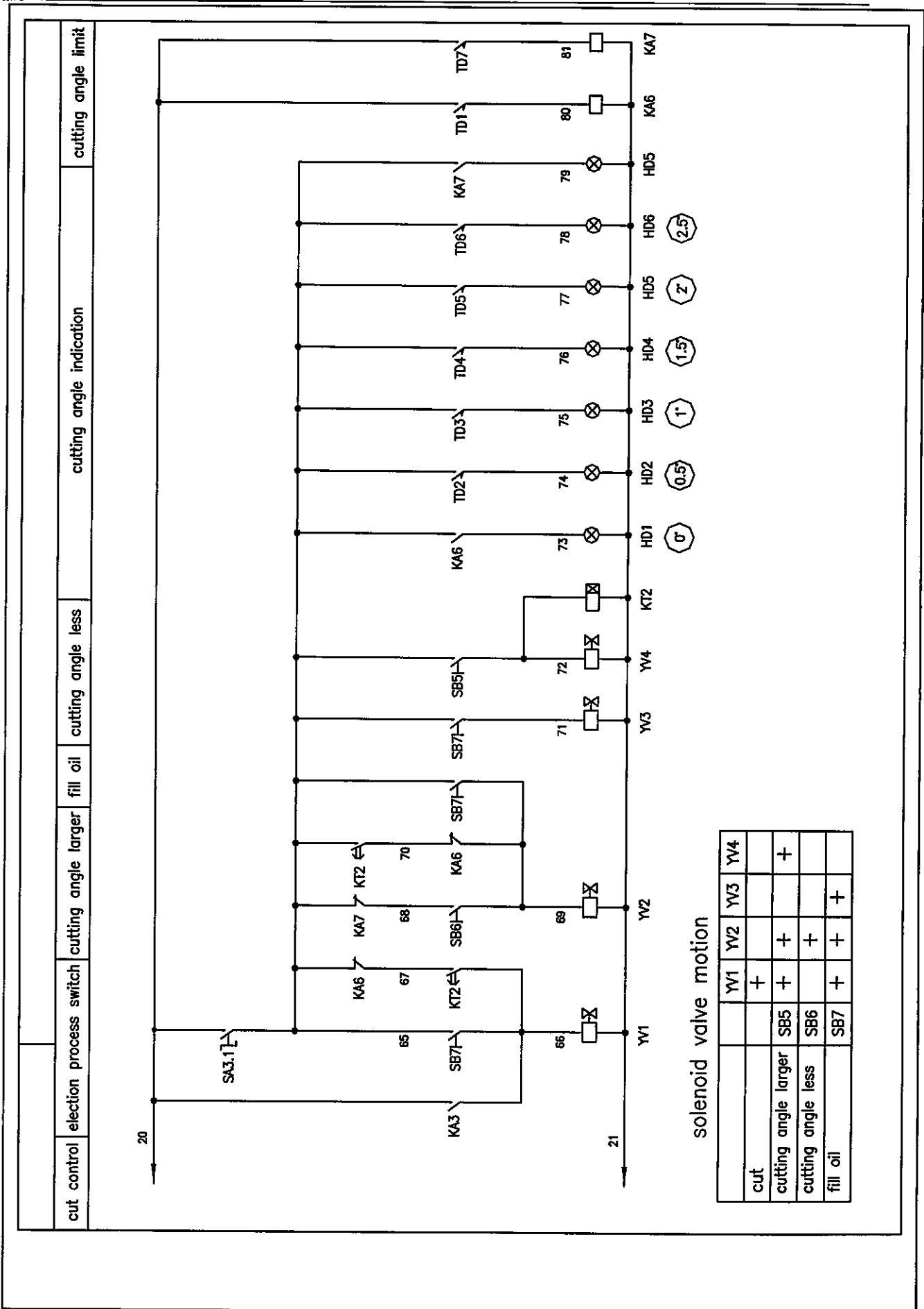
7.4 Electric components list (refer to table 2)

Electric principle print(chart 5)



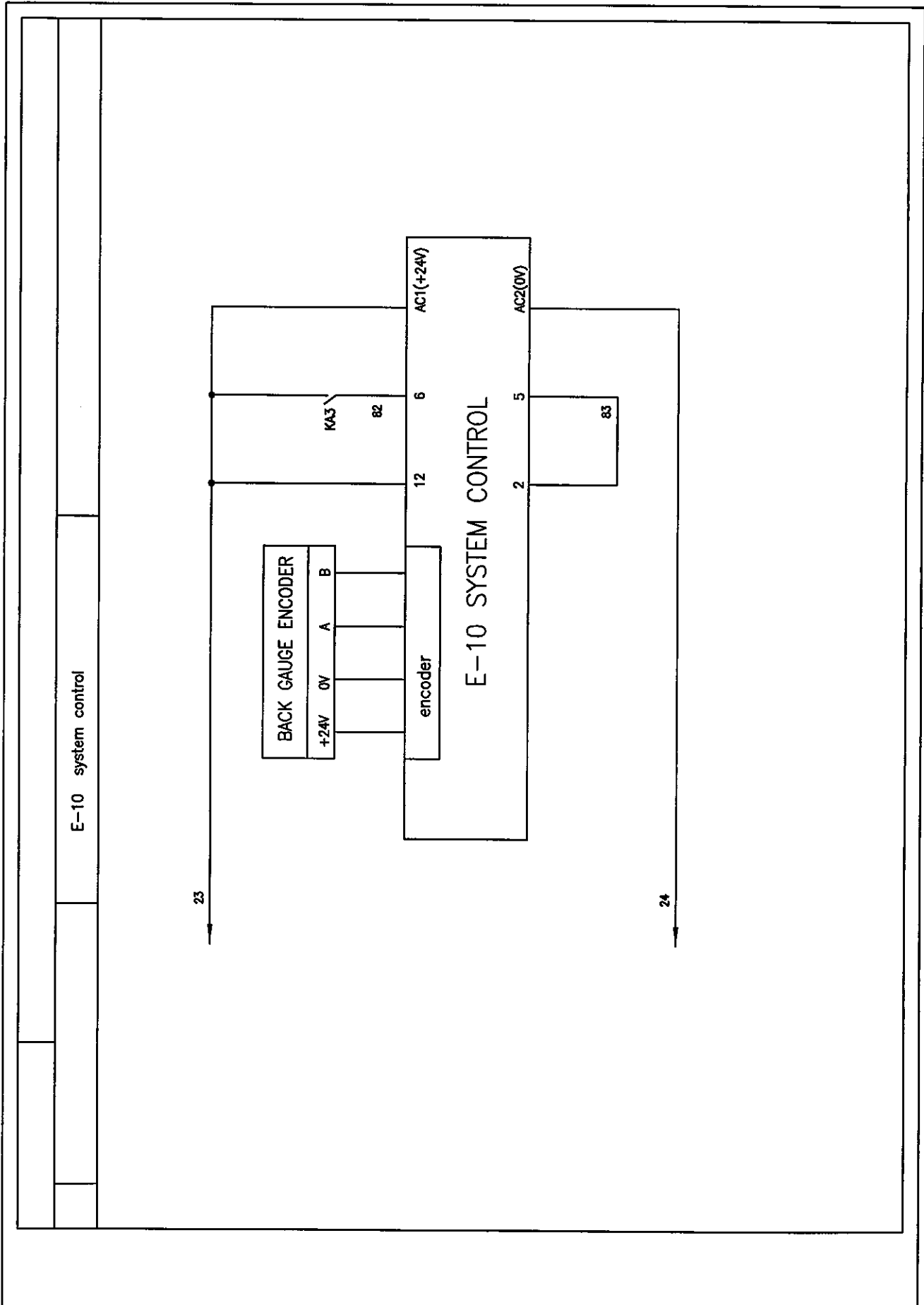






solenoid valve motion

	YW1	YW2	YW3	YW4
cut	+			
cutting angle larger	+	+		+
cutting angle less		+		
fill oil	+	+	+	



Electric components list(table 2)

Code	Item	Model	Specs	Usage
KM1	AC connector	LC1-D3210B7	4 《0》 +1 《C》	Oil pump motor control
KM2	AC connector	LC1-D0901B7	3 《0》 +1 《C》	Backgauge motor control
KM3	AC connector	LC1-D0901B7	3 《0》 +1 《C》	Backgauge motor control
KA1	Middle relay	LC1-D0901B7	3 《0》 +1 《C》	process control
KA2	Middle relay	LC1-D0901B7	3 《0》 +1 《C》	process control
KA3	Middle relay	LC1-D0901B7	3 《0》 +1 《C》	process control
KA4	Middle relay	LC1-D0901B7	3 《0》 +1 《C》	process control
KA5	Middle relay	LC1-D0901B7	3 《0》 +1 《C》	process control
FR	Heat relay	LR2-D1322	185~25A	Heat protection of oil pump motor
QF	Air switch	NS80H-MA	63A	Power control of whole machine
QF1	Breaker switch	C65N 3PC32A	3P 32A	Short circuit protection for oil pump motor
QF2	Breaker switch	C65N 3PC3A	3P 4A	Back gauge motor circuit overload protection
SQ1	Limit switch	TZ-9208	1 《0》 +1 《C》	Back gauge front limit
SQ2	Limit switch	TZ-9208	1 《0》 +1 《C》	Back gauge back limit
SQ3	Limit switch	TZ-9208	1 《0》 +1 《C》	Knife beam upper limit
SQ4	Limit switch	TZ-9208	1 《0》 +1 《C》	Knife beam lower limit
SA1	Key switch	ZB2-BG21	2 《0》	power of control
SA2	change switch	ZB2-BD21	1 《0》	Alignment Light switch
SA3	Change switch	ZB2-BD33	2 《0》 + 《C》	Selection of adjust/single
SB0	Emergency stop	ZB2-BS542	1 《C》	Emergency stop
SB1	Emergency stop	ZB2-BS542	1 《C》	Emergency stop
SB2	Emergency stop	ZB2-BS542	1 《C》	Emergency stop
SB3	Start button	ZB2-BW3361	1 《0》	Oil pump start button
SB4	Control button	ZB2-BA42	1 《C》	Oil pump stop
SB5	Control button	ZB2-BA31	1 《0》	reduce the cutting angle
SB6	Control button	ZB2-BA31	1 《0》	Enlarge the cutting angle
SB7	Control button	ZB2-BA31	1 《0》	Oil filling

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SB8	Control button	ZB2-BA51	1 《0》	Control the positive rotating of back gauge motor.
SB9	Control button	ZB2-BA51	1 《0》	Control the reverse rotation of the back gauge motor
HL1	Indicator	XB7-EV61	AC 24V	Indicator of power on or off
HL2	Indicator	DL1-CE0024	AC 24V	Start Indicator of oil pump motor
PC	Times relay	JDM10A-4S	AC 24V	Continuous cutting times
KT1	Time relay	ST3PA-Y	AC 24V	Motor start delay
KT2	Time relay	JSS21-A	AC 24V	Cutting angle decrease delay
VE1	Switch power	S-145-24	145W	Supply direct current power
VE2	Switch power	S-145-24	145W	Supply direct current power
TC	Transformer	JBK5-630VA	415V/220V 24V	Supply control circuit power
S1	Foot switch	JWL1-11	1 《0》	Control of knife moving down
FU1	Fuse box	C65N 3PC32A	3P 32A	System short circuit protection
FU2	Fuse box	C65N 1PC6A	1P 4A	System short circuit protection
FU3	Fuse box	C65N 1PC6A	1P 4A	System short circuit protection
FU4	Fuse box	C65N 1PC6A	1P 4A	System short circuit protection
FU5	Fuse box	C65N 1PC6A	1P 4A	System short circuit protection
FU6	Fuse box	C65N 1PC6A	1P 4A	System short circuit protection
FU7	Fuse box	C65N 1PC6A	1P 1A	System short circuit protection
PF	Photoelectric switch	BEN 10M-TFR2		Back protection
	Position display	E10		backgauge count
	Encoder	ENC-100-A		

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 0.07~0.1 times of the plate thickness, the plate thickness =0.07~0.1t. The above is for $\sigma_b=450-500\text{N/mm}^2$. For more than $450-500\text{N/mm}^2$, it is suggested to use smaller clearance. And for less than $450-500\text{N/mm}^2$, 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 PROHIBITED

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	10x1.9	2
9	O-Ring	11x1.9	2
10	O-Ring	12x2.4	2
11	O-Ring	16x2.4	5
12	O-Ring	24x2.4	5
13	O-Ring	30x3.1	10
14	O-Ring	35x3.1	4
15	O-Ring	40x3.1	5
16	O-Ring	55x3.1	20
17	O-Ring	50x3.1	4
18	Pad	27	6
19	Pad	33	4
20	ferrule	22	5
22	ferrule	28	5

QC11Y-12X3200
Hydraulic Guillotine shears

QUALIFICATION CERTIFICATE

Sheet Thickness: 12 mm

Sheet Length: 3200 mm

Serial No.:

This machine is permitted to leave the factory after the quality is up to the standard.

Brief Introduction

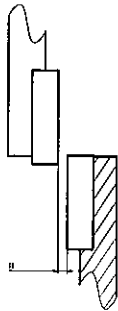
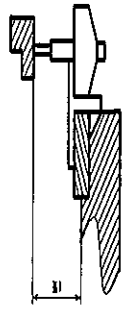
1. This qualification certificate is drawn up according to the GB/T14404-93 "Accuracy of Beam Shear".
2. Requirement:
 - (1) Tensile strength $\delta_b \leq 450\text{N/mm}^2$
 - (2) Test sheet length is the Max. Cutting length.
 - (3) Width of the test sheet is 20 times of the cutting thickness and not less than 80mm.
 - (4) Thickness of the test sheet is half of the Max. Cutting thickness of the machine.
 - (5) The quantity of the rest sheet is not less than 2.
 - (6) Don't inspect the end of the cutting sheet which is equal to 10 times of the sheet thickness. Allow to eliminate the burr or out of the measurement.
3. Machine Inspection:

The vertical and horizontal of the table is required to 0.2/1000mm

1.

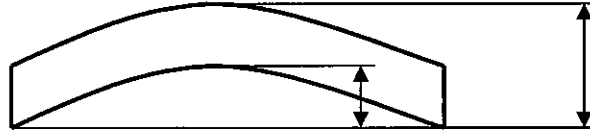
Item	Allowable Error	Inspection Means	Inspection Method	Actual Error	
				position	value
Adjustment of the machine: vertical	0.20/1000	level	Place the level to the table and read the show value	Left right	0.18

2. Geometric Accuracy

NO	Item	Fig.	Inspection Means	Inspection Method	Deviation		Result
					Allowable Error		
G1	Uniform between the upper and bottom knife blades		feeler	Use the feeler to measure some points in the blade clearance. The error is calculated by the Max. reading	Sheet length	Full length	0.06
					>2.5~8	0.05	
					>8~16	0.12	
					>16~25	0.18	
G2	Parallel between table and gauge		Depth rule	Fix the retainer in front and behind position and measure the range between the bottom blade and retainer. The error is calculated by the Max. reading	1000mm length: 0.10	0.10	

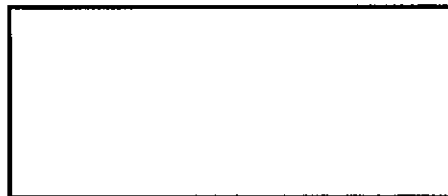
3. Inspection of the Working Accuracy

Inspection 1(P1)



Item	Method	Tool	Allowable error	Result
Straight of the cut sheet	Use the straightedge to lean the cutting surface of the sheet and measure the clearance by the rule.	Rule straightedge	0.25 within the length of 1000mm	0.25

Inspection 2(P2)



Item	Method	Tool	Allowable error	Result
Parallel of the cut sheet	Measure the distance between the responding points of the two vernier caliper	Vernier caliper	0.15 within the length of 1000mm	0.15

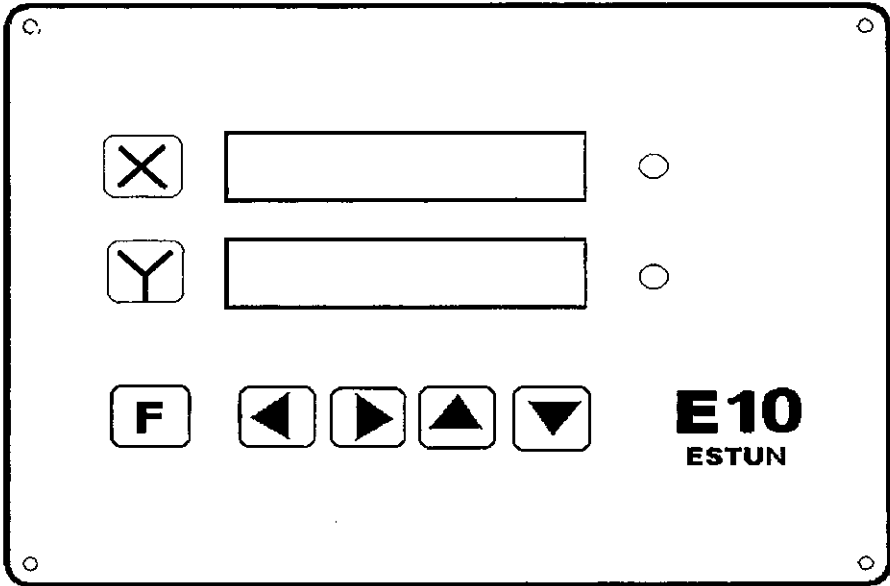
E10

Reference Manual

Operation

Chapter 1 Operation panel

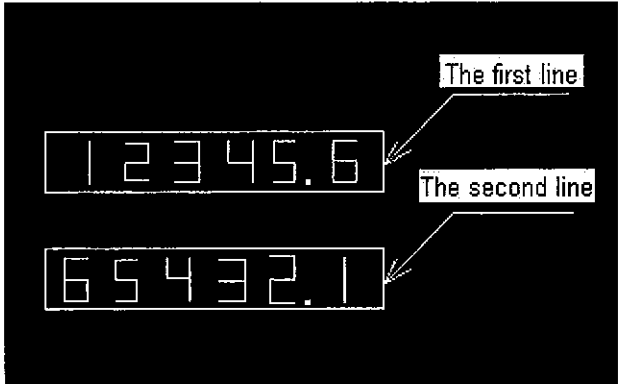
1.1 Operation panel



E10 digital instrument panel instruction

2.2 General description for operating panel

1.1 Digital display



There are 12 characters displayed in two lines

Display in normal status:

The first line displays X-axis position.

The second line displays Y-axis position (shearing counters displayed in shearing machine .)

Display in teach-in parameter and machine tool parameter modifications:

The first line displays parameter numbers.

The second line displays the content of corresponding parameter.

1.2.2 Keys

There are 5 membrane keys in front panel which could be divided into function key, positioning keys and numerical keys according to the functions.

Function keys:



-----Enter key. Used for confirm the modification of the parameters.

Positional keys:



-----Leftward moving key, used during parameter editing to move the cursor from current digit to one digit leftward.



----- Rightward moving key, used during parameter editing to move the cursor from current digit to one digit rightward.

Numerical keys:



-----increase key, used during parameter editing to increase current parameter value with 1.(when current value is 9, it will be 0 after pressing this key.)



-----decrease key, used during parameter editing to decrease current parameter value with 1.(when current value is 0, it will be 9 after pressing this key.)

1.2.3 LED lamp

There's one LED lamp in the front panel:

LED lamp behind the first line digital display

-----Alarm LED. It will be lid if there's no one-side positioning on X-axis,which means screw rod gap still remains.

There are six LED lamps on back panel:

Meaning of the two LED lamps:

LED1

(+5V) ----- Lit to show 5V power supply of the system works normally.

LED2

(+12V) ----- Lit to show 12V power supply of the system works normally.

4 LED lamps for Input and output:

LED3

(T1IN) ----- Lit to show channel 1 has input signals

LED4

(T2IN) ----- Lit to show channel 2 has input signals

LED5

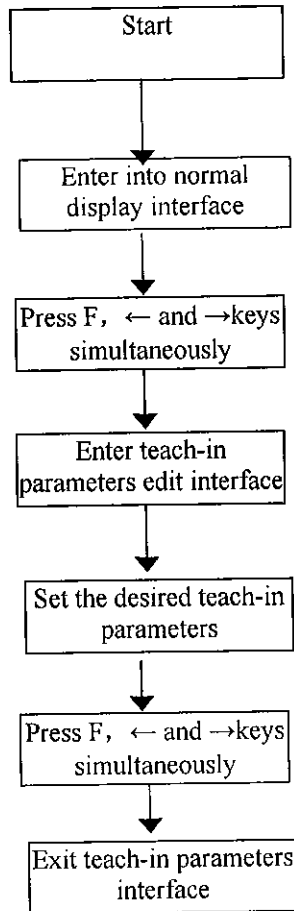
(T1OUT) ----- Lit to show channel 1 has output signals

LED6

(T2OUT) ----- Lit to show channel 2 has output signals

Chapter 2 E10 teach-in parameters

2.1 Flowchart for setting Teach-in parameters



2.2 Set teach-in parameters

Press Enter, leftward moving key and rightward moving key simultaneously to enter teach-in parameter editing interface; first line of digital display will display teach-in parameter numbers and second line displays parameter value. The flashing digit means position of parameters that under change.

1. Find the teach-in parameter number that need to be changed

Press numerical keys to change the existing value and press the positioning keys to select the digit to be changed. After entering the new value, press Enter to confirm.

2. Edit the contend of the parameters

Press numerical keys to change the existing value and press the positioning keys to select the digit to be changed. After entering the new value, press Enter to confirm.

Note: 1. Edit of current positions of X-axis and Y-axis must be performed with power OFF, otherwise, the teach-in position value will flash 6 seconds to alarm a fault occurs.

2. The parameters of machine tools must be set first and then the teach-in parameters if it is the first time setting the parameters.

3. Every parameter has its range. If the preset value exceeds the range, then the parameter will be the max limits as its value.

4. As for shearing machine, press the increase key and decrease key together to count shearing or clear counters.

For example, to change PAC02 parameter as 100.0 (suppose the original value of PAC02 is 0.0)

First press Enter, Leftward moving key and rightward moving to enter teach-in parameter interface. Then the first line of digital display shows PAC 01 and the last digit "1" will flash. Press increase key to edit 1 to 2 and press Enter. After that, the digits of first line will all flash once and "1" stops flashing. While second line displays 0.0, and the last digit "0" will flash. Press the leftward moving key for 3 times to make "0" on fourth digit flash. Press Enter, then the second line will display 100.0 and "1" is flashing. Press Enter again to confirm the edit. After that, all digits of the second line will flash. At last, press Enter, leftward moving key and rightward moving key together to exit Teach-in parameter edit interface.

2.3 Teach-in parameters

The teach-in parameters and there meanings are shown as follows:

Press brake teach-in parameters:

PAC 01.	X-axis current position Range: 0 — 999999 Unit: Display Unit Default : 0	Display X-axis current position
PAC 02.	Y-axis current position Range: 0 — 999999 Unit: Display Unit Default : 0	Display Y-axis current position
PAC 03.	T1 time setting Range: 10 — 50000 Unit: ms Default : 1000	Used to set stop time for relay 1.
PAC 04.	T2 time setting	Used to set stop time for relay 2.

Range: 10 — 50000
Unit: ms
Default : 1000

Teach-in parameters for shearing machine:

PAC 01. X-axis current position

Display current position of backgauge

Range: 0 — 999999
Unit: Display Unit
Default : 0

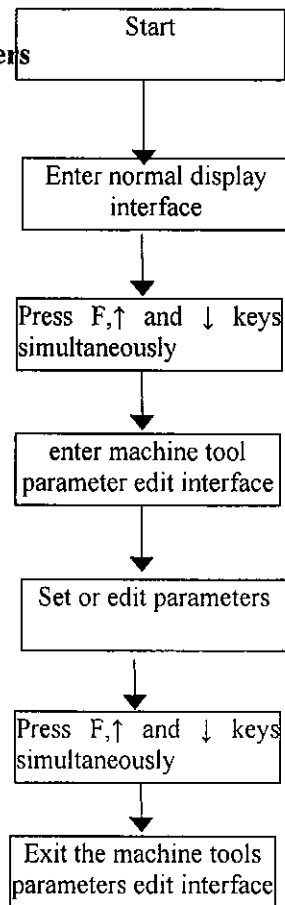
PAC 02. time setting of time relay

Used to set relay stop time

Range: 10 — 50000
Unit: ms
Default : 1000

Chapter 3 E10 machine tools parameters

3.1 Flowchart for setting machine tools parameters



3.2 Set machine tools parameters

Press Enter, increase key and decrease key simultaneously to enter machine tools parameter editing interface; first line of digital display will display parameter numbers and second line displays parameter value. The flashing digit means position of parameters that under change.

1. Find the teach-in parameter number that need to be changed

Press numerical keys to change the existing value and press the positioning keys to select the digit to be changed. After entering the new value, press Enter to confirm.

2. Edit the contend of the parameters

Press numerical keys to change the existing value and press the positioning keys to select the digit to be changed. After entering the new value, press Enter to confirm.

Take change the PAN 13 parameter value to 100.0 for example (suppose the original value of PAN 13 is 0.0)

First press Enter, increase key and decrease key to enter machine parameter editing interface. Then the first line of digital display shows PAN 01 and the last digit “1” will flash. Press increase key twice to edit 1 into 3 and press leftward moving key to stop flashing. Then “0” a digit before will begin to flash, press increase key again to make it display 1. After that, press Enter key and then the digits of first line will all flash once and “1” stops flashing. While second line displays 0.0, and the last digit “0” will flash. Press the leftward moving key for 3 times to make “0” on fourth digit flash. Press Enter, then the second line will display 100.0 and “1” is flashing. Press Enter again to confirm the edit. After that, all digits of the second line will flash. At last, press Enter, increase key and decrease key to exit machine parameter editing interface.

Note:

1. During displacement tolerance parameter editing, press increase or decrease key to select if it is positive or negative on the 6th digit.
2. Every parameter has its own range, if the preset value exceeds the range, then the system will adopt the max limit value as its parameter.
3. The parameter numbers of press brake range from 1- 51, if entered parameter number higher than 51 or smaller than 1. The parameter will be displayed as 51.
4. The parameter numbers of shearing machine ranges from 1-26, if entered parameter number higher than 26 or smaller than 1, the parameter will be displayed as 1.

3.3 Parameter description

Press brake parameters:

Parameter No.	Parameter names	Default	User's setting
PAN01	Decimal point position on X-axis	1	
PAN02	Decimal point position on Y-axis	2	
PAN03	Multiple factor of X-axis	4	
PAN04	Multiple factor of Y-axis	4	
PAN05	Dividing factor of X-axis	1	
PAN06	Dividing factor of Y-axis	1	
PAN07	Screw gap of X-axis	0	
PAN08	Screw gap of Y-axis	0	
PAN09	counter direction of X-axis	1	
PAN10	Counter direction of Y-axis	1	
PAN11	X-axis position 0	0	
PAN12	X-axis displacement position 0	0	
PAN13	X-axis position 1	0	
PAN14	X-axis displacement position 1	0	

PAN15	X-axis position 2	0	
PAN16	X-axis displacement position 2	0	
PAN17	X-axis position3	0	
PAN18	X-axis displacement position 3	0	
PAN19	X-axis position4	0	
PAN20	X-axis displacement position 4	0	
PAN21	X-axis position5	0	
PAN22	X-axis displacement position 5	0	
PAN23	X-axis position6	0	
PAN24	X-axis displacement position 6	0	
PAN25	X-axis position7	0	
PAN26	X-axis displacement position 7	0	
PAN27	X-axis position8	0	
PAN28	X-axis displacement position 8	0	
PAN29	X-axis position9	999999	
PAN30	X-axis displacement position 9	0	
PAN31	Y-axis position0	0	
PAN32	X-axis displacement position 0	0	
PAN33	Y-axis position1	0	
PAN34	Y-axis displacement position 1	0	
PAN35	Y-axis position2	0	
PAN36	Y-axis displacement position 2	0	
PAN37	Y-axis position3	0	
PAN38	Y-axis displacement position 3	0	
PAN39	Y-axis position4	0	
PAN40	Y-axis displacement position 4	0	
PAN41	Y-axis position5	0	
PAN42	Y-axis displacement position 5	0	
PAN43	Y-axis position6	0	
PAN44	Y-axis displacement position 6	0	
PAN45	Y-axis position7	0	
PAN46	Y-axis displacement position 7	0	
PAN47	Y-axis position8	0	
PAN48	Y-axis displacement position 8	0	
PAN49	Y-axis position9	999999	
PAN50	Y-axis displacement position 9	0	
PAN51	T1OUT,T2OUT output meanings	1	

PAN56	Recover the default value	0	
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Parameters of shearing machine:

Parameter No.	Parameter names	Default	User's setting
PAN01	Decimal point position of X-axis	1	
PAN02	X-axis multiple factor	4	
PAN03	X-axis dividing factor	1	
PAN04	X-axis screw rod gap	0	
PAN05	X-axis counter direction	1	
PAN06	X-axis position0	0	
PAN07	X-axis displacement position 0	0	
PAN08	X-axis position1	0	
PAN09	X-axis displacement position 1	0	
PAN10	X-axis position2	0	
PAN11	X-axis displacement position 2	0	
PAN12	X-axis position3	0	
PAN13	X-axis displacement position 3	0	
PAN14	X-axis position4	0	
PAN15	X-axis displacement position 4	0	
PAN16	X-axis position5	0	
PAN17	X-axis displacement position 5	0	
PAN18	X-axis position6	0	
PAN19	X-axis displacement position 6	0	
PAN20	X-axis position7	0	
PAN21	X-axis displacement position 7	0	
PAN22	X-axis position8	0	
PAN23	X-axis displacement position 8	0	
PAN24	X-axis position9	999999	

PAN25	X-axis displacement position 9	0	
PAN26	T1OUT,T2OUT output meaning		
PAN30	Recover the default	0	

Since the difference between shearing machine and press brake only lies in the parameter numbers while the meanings, units, default values are all the same. So we only illustrate the parameter of the press brake in details.

PAN 01. Decimal point of X- axis

Range : 0—4

Unit: None

Default: 1

Description: Used to fix the position of decimal point of the numbers displayed

PAN 02. Decimal point of Y- axis

Range : 0—4

Unit: None

Default: 2

Description: Used to fix the position of decimal point of the numbers displayed

PAN 03. Multiple factor on X-axis

Range : 1—9999

Unit: None

Default: 4

Description: controller accept pulse signals from the external and displayed in mm. This requires an switching process, which explain why the multiple factor and dividing factor exist.

Multiple factor = number of encoder wires × multiple frequency constant of encoder × display resolutions

The display resolution is relative with the decimal point position. If it is not a decimal number, then the resolution is 1; if it has one digit after decimal point, then the resolution is 0.01; if it has two digits after decimal points, then the resolution is 0.001.

Multiple frequency constant of encoder: the constant in the decode circuit, it value is always 4.

Number of encoder wires: decided by the encoder applied.

PAN 04. Y -axis multiple factor

Range : 1—9999

Unit: None

Default: 4

Description: the same as PAN 03

PAN 05. X-axis dividing factor

Range : 1—9999

Unit: None

Default: 1

Description dividing factor = screw rod pitch × deceleration ratio between encoder and transfer screw rod

Let $F = \text{multiple factor} / \text{dividing factor}$

That is to say, F is used to display the unit plus one, the number of pulse generated from encoder

Deceleration ratio between encoder and transfer screw rod: the encoder cycle numbers when the transfer screw rod cycles once

MM:

Multiple frequency constant = 4

Resolution = 0.1

Screw rod pitch = 10mm

Deceleration ratio between encoder and transfer screw rod = 1

That is $F = 100 \times 4 \times 0.1 / 10 = 4 / 1$

Enter multiple factor 4, dividing factor 1; every 4 pulse represent one displayed unit (0.1mm)

PAN 06. Y-axis dividing factor

Range : 1—9999

Unit: None

Default: 1

Description : the same as PAN 05

PAN 07. Screw rod pitch of X-axis

Range : 0—99999

Unit: Display Unit

Default: 0

Description : There are some gaps between screw rods, as for X, when the system is working, if the alarm for one-side positioning not done will be triggered is decided by the existence of gap and the distance of the gap.

PAN 08. Screw rod pitch of Y -axis

Range : 0—99999

Unit: displays Unit

Default: 0

Description : There are some gaps between screw rods. As for Y-axis, when gap exists, it could be compensated to avoid fault and position more accurately

PAN 09. X -axis counter direction

Range : 0—1

Unit: None

Default: 1

Description: 0: Minus

1: plus

PAN 10. Y-axis counter direction

Range : 0—1

Unit: None

Default: 1

Description: 0: Minus

1: plus

PAN 11. X-axis position0

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Displacement of screw rod 0.

PAN 12. X-axis displacement position 0

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 0

PAN 13. X-axis position1

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : screw rod displacement position 1

PAN 14. X-axis displacement position 1

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 1

PAN 15. X-axis position2

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : screw rod displacement position 2

PAN 16. X-axis displacement position 2

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 1

PAN 17. X-axis position3

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : screw rod displacement position 3

PAN 18. X-axis displacement position 3

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 1

PAN 19. X-axis position4

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 3

PAN 20. X-axis displacement position 4

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 4

PAN 21. X-axis position5

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 5

PAN 22. X-axis displacement position 5

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 5

PAN 23. X-axis position6

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 6

PAN 24. X-axis displacement position 6

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 6

PAN 25. X-axis position7

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 6

PAN 26. X-axis displacement position 7

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 7

PAN 27. X-axis position8

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 8

PAN 28. X-axis displacement position 8

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 8

PAN 29. X-axis position9

Range : 0—999999

Unit: Displays Unit

Default: 999999

Description : Screw rod displacement position 9

PAN 30. X-axis displacement position 9

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 9

PAN 31. Y-axis position0

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 0

PAN 32. Y-axis displacement position 0

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 0

PAN 33. Y-axis position1

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 1

PAN 34. Y-axis displacement position 1

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 1

PAN 35. Y-axis position2

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 2

PAN 36. Y-axis displacement position 2

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 2

PAN 37. Y-axis position3

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 3

PAN 38. Y-axis displacement position 3

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 3

PAN 39. Y-axis position4

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 4

PAN 40. Y-axis displacement position 4

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 4

PAN 41. Y-axis position5

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 5

PAN 42. Y-axis displacement position 5

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 5

PAN 43. Y-axis position6

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 6

PAN 44. Y-axis displacement position 6

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 6

PAN 45. Y-axis position7

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 7

PAN 46. Y-axis displacement position 7

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 7

PAN 47. Y-axis position8

Range : 0—999999

Unit: Displays Unit

Default: 0

Description : Screw rod displacement position 8

PAN 48. Y-axis displacement position 8

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 8

PAN 49. Y-axis position9

Range : 0—999999

Unit: Displays Unit

Default: 999999

Description : Screw rod displacement position 9

PAN 50. Y-axis displacement position 9

Range : -9999—9999

Unit: Displays Unit

Default: 0

Description: the compensating value for screw rod displacement position 9

PAN51. T1OUT,T2OUT output meanings

Range : 0—1

Unit:

Default: 1

The function of output interfaces T1OUT,T2OUT is decided by the setting. When it is set as 0, it functions as time relay output;1, the T1OUT outputs as min. value of X-axis while T2OUT outputs as Max. value of X-axis. When higher than the max. value, the external relay with terminal of max. value output will lose power and when smaller than the min. value, the external relay with terminal of min. value output will lose power.

PAN 56. recover the default value

Range : 0—1

Unit: None

Default: 0

Description : When the parameter is 0, it is not effective. When the parameter is 1, all the parameters will recover to the default.