

DEF-FA/60SS
OPERATION INSTRUCTION

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1.Safety instructions

DO NOT START MOTOR UNTIL YOU HAVE READ AND UNDERSTOOD THIS SAFETY SECTION AND THE SECTION ON STARTING PROCEDURE. (PAGE13)

BE A CAREFUL OPERATOR

READ THIS USAGE INSTRUCTION SERIOUSLY TO KNOW WHAT YOU ARE DOING. MOST ACCIDENTS OCCUR DUE TO PEOPLE'S FAILURE TO FOLLOW THE SIMPLE, FUNDMENTAL SAFETY RULES OR PRECAUTIONS, AND REGARDLESSNESS OF THE CARE USED IN THE DESIGN AND CONSTRUCTION OF THE TUBE END FINISHING MACHINE.

THERE ARE MANY POINTS THAT CANNOT BE COMPLETELY GUARDED; THEREFORE, A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST ACCIDENTS.

NEVER PLACE YOUR HANDS, FINGERS OR ANY PARTS OF YOUR BODY INTO THE DANGEROUS AREAS OF THE END FINISHING MACHINE UNLESS THE MOTOR HAS BEEN TURNED OFF AND THE MAIN POWER SWITCH IS IN THE OFF POSITION AND TAGGED.

DANGEROUS AREAS OF THE END FINISHING MACHINE ARE:

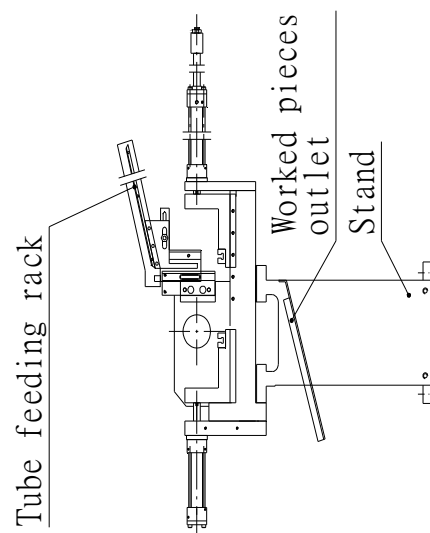
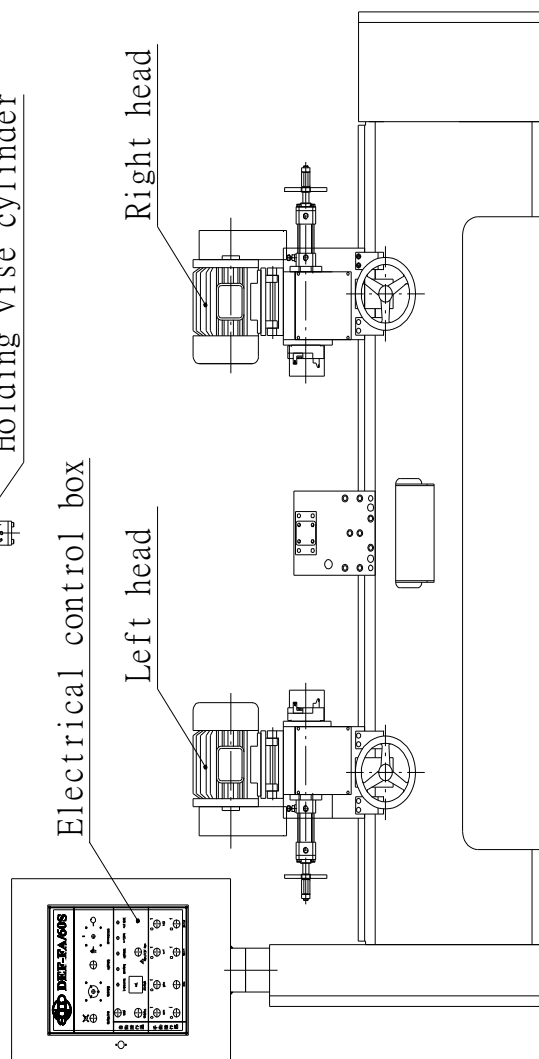
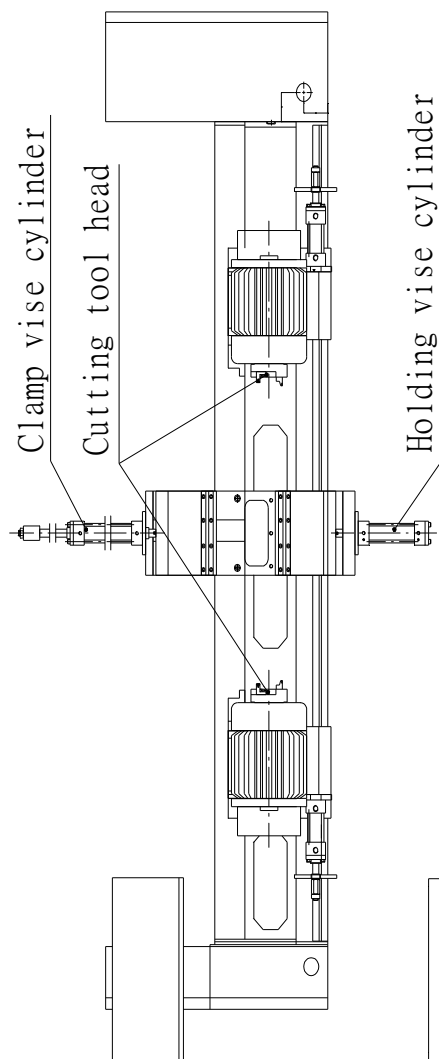
- 1.AREA DEFINED BY THE TOTAL TRAVLLING OF THE CUTTING HEAD
- 2.VISE AND JAW TRAVELLING AREA
- 3.AUTOMATIC CYLINDER STROKE AREA
- 4.WORK AREA AHEAD OF THE MACHINE
- 5.CUTTING CHIPS WILL FLY AWAY AROUND THE MACHINE. SO YOU HAVE TO WEAR THE SAFETY GLASSES DURING OPERATING THE MACHINE.

WARNING

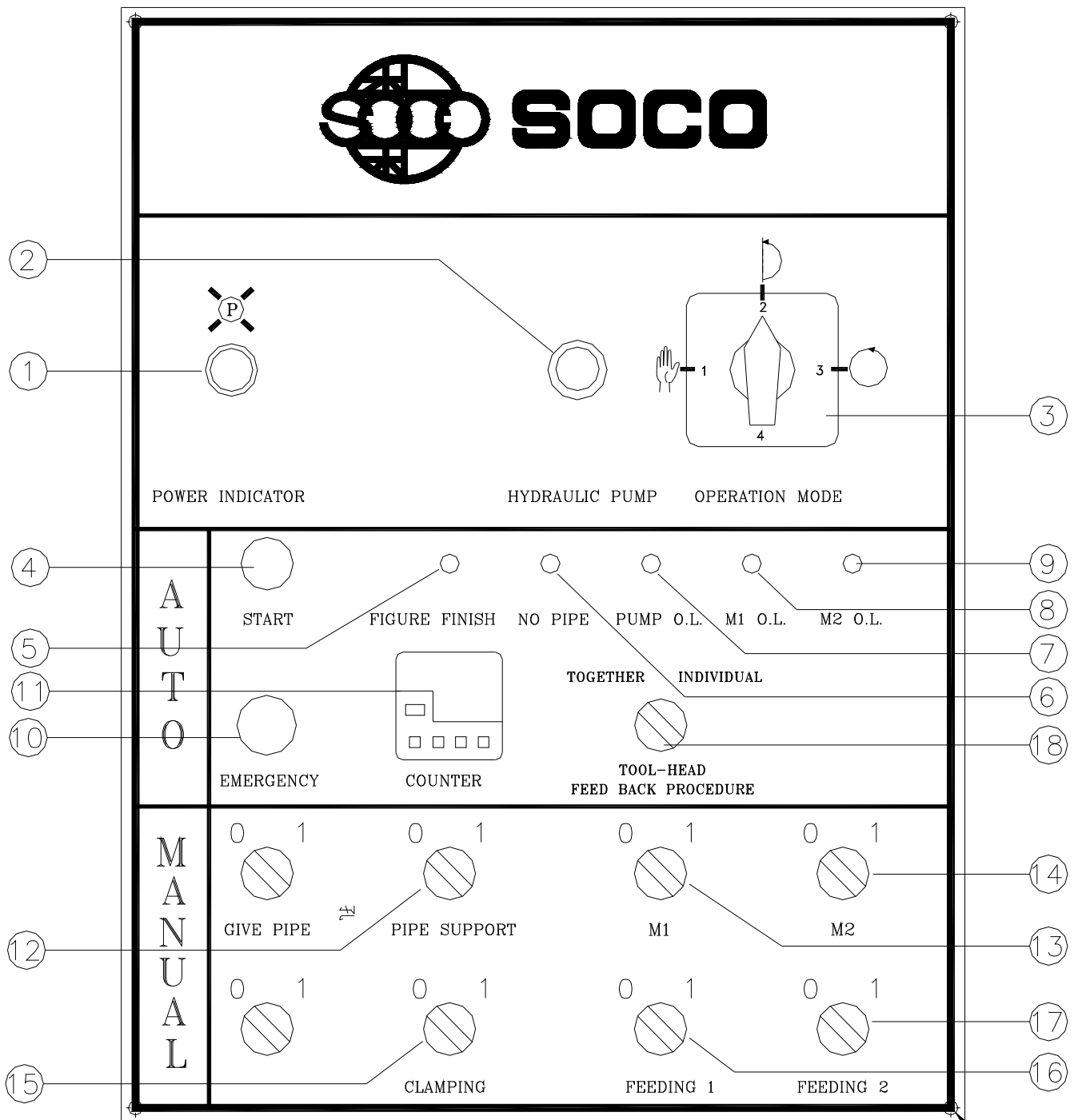
HIGH VOLTAGE WILL PRESENT IN THIS MACHINE. TURN THE MAIN POWER OFF BEFORE CHANGE TOOLS OR PERFORM SERVICE OPERATIONS.

2. Machine outline & specifications

DEF-FA/60SS	
Item	Specifications
Spindle motor	2HP x 6P For both right head and left head
Spindle RPM	912 RPM
Working Functions & Capacity	Standard Functions a. Tube inside & outside edge chamfering & facing. Tube O.D. $\phi 15 \sim \phi 60$mm, 2.5mm max. wall thickness. b. Bar out-edge chamfering. Bar O.D. $\phi 9 \sim \phi 30$mm, C5 chamfer Bar O.D. $\phi 30 \sim \phi 60$mm, C3 chamfer c. Work piece length : 25mm to 300mm
	Optional Functions c. Tube inside & outside edge chamfering & facing with special tool seats Tube O.D. $\phi 9 \sim \phi 13$mm d. With special tool's head & tool seat Bar out-edge chamfering & centering.
Standard Accessories	a. One piece standard tool head. (E2A018) b. One set chamfering jaws (for one O.D. size) c. Tool seats E2A021/E2A031/E2A032/E2A034/E2A035 /E2A036, for tube $\phi 15 \sim \phi 60$ mm(O.D.)
Optional Accessories	d. Tool seats E2A019/E2A021/E2A042 for tube $\phi 9 \sim \phi 13$ mm(O.D.) e. Tool head E2A038 & tool seat E2K101 for Bar end centering. f. Oil mist system. g. Different size clamping jaws.
Hydraulic System	1HP/20 Liter pump, working pressure 20~30 kg/cm ²
Weight	1260 KG
Dimensions W x D x H cm	225 x 220 x 160



3. Function description for each unit on control panel



Item	Name and Description
1	Power indicator.
2	Hydraulic pump engage button.
3	Operation mode switch for manual operation, semi-auto cycle operation and auto-cycle operation.
4	Start button and indicator. When Item 3 operation mode switch has been set to  or  position, push this button will start semi-auto or auto-cycle operation.
5	Figure finish indicator. When the number of worked pieces reaches to the number set in the counter, the machine will automatically stop and this indicator will brighten.
6	No pipe indicator. When it is bright means there are no work pieces in the machine.
7	Hydraulic pump overload indicator.
8	Left head motor overload indicator.
9	Right head motor overload indicator.
10	Emergency stop button.
11	Counter, showing the number of output worked pieces.
12	Manual switch for pipe support.
13	Manual switch for left head motor on/off.
14	Manual switch for right head motor on/off
15	Manual switch for clamp arm, close or release.
16	Manual switch for left head feeding or return.
17	Manual switch for right head feeding or return.
18	Tool-head feed back procedure select switch

NOTICE:

1. Switch of Item 12~17 belong to the manual operating area. They are designed for the purpose of testing & adjusting the machine. It is necessary the Item 3 operation mode switch be set to the left (hand) position before those switches in manual operation area become operable.
2. If any red indicators of Item 7~9 turn to bright, it means there is an abnormal condition in the machine. It will need to solve the problem which cause the red indicator bright before the machine can be operated normally again.

CAUTION !

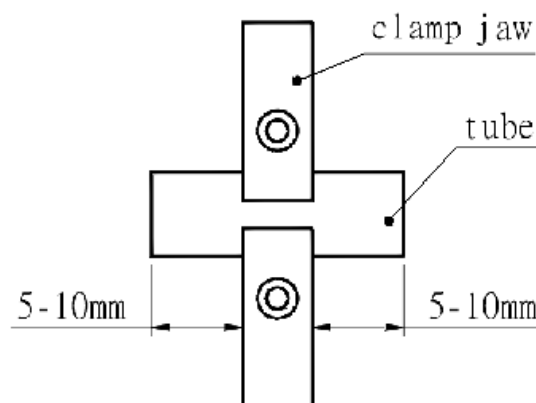
Switch Item 12~17 to “off” position after complete manual test to prevent the sudden damage which might occur when operation mode changed..

4. Replace & adjust the clamp jaws

4-1) The clamp jaws shall be replaced and adjusted when different diameter and length of tubes are worked.

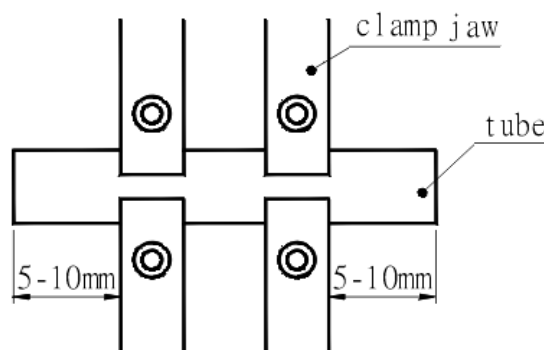
a. Tube length 25mm~60mm

Use one pair of clamp jaws in front & rear side.



b. Tube length 60mm~300mm

Use two pairs of clamp jaws in front & rear side.



NOTICE: After set the clamp jaws, don't solidly tighten the fixing screws immediately. Put the tube in jaws position and use manual operation mode NO.15 to clamp the tube, then tighten the fixing screws solidly.

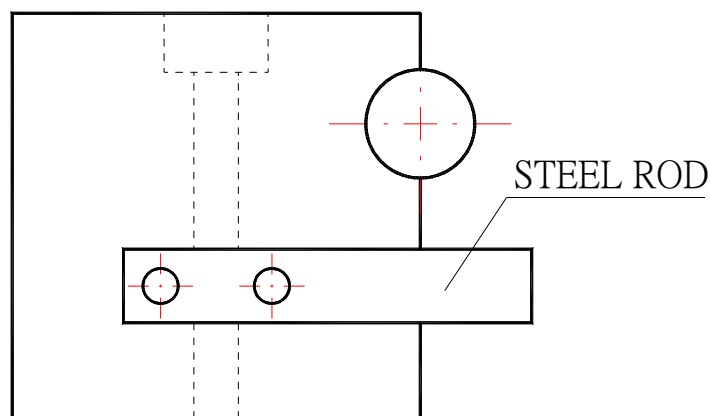
4-2) Adjust the forward dead line of the rear clamp jaw

There is a device on the hydraulic cylinder's front plate which can be adjusted to set the forward dead line of rear clamp jaw. The proper dead line of the rear clamp jaw can be set by adjusting the jaw's center line to over-forward the center line of the work tube about 0.2mm, thus the clamp force will hold the tube firmly and not deform it.

It was designed that there will be a 4mm gape between the front and the rear jaws when clamping, for the sake of easy dropping the worked tube.

NOTICE: This adjustable cushion device on the front plate of cylinder can also be adjusted to slow down the rear jaw's speed to touch the tube. Be sure not to put it too slow to clamp the tube firmly before the cutting head cut in.

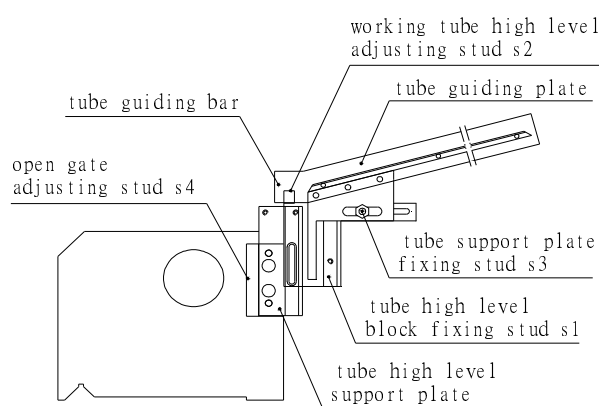
4-3) If the work tube's length is more than 170mm, put a steel rod on one side of the rear clamp jaw to make the worked tube drop out from the machine easily.



5. Adjust tube feeding device & the distance between two heads, according to the work tube's length & tube's outside diameter.

5-1) Adjust the tube's center line correspond to the clamp jaw's center line.

- a) Release the tube high level block fixing stud s1 (refer to drawing below).
- b) Put one tube in the clamp jaw.
- c) Adjust the work tube high level adjusting stud s2, to move the block up or down and let the tube's bottom just be on the top of the tube's high level support plate, than solidly fix the s1.



5-2) Adjust tube support plate & tube guiding bar

- a) Release the tube support plate fixing stud s3, move the support plate back and forth, let the work tube can go through the gape, which between the tube guiding bar and the tube support plate, have 1~2 mm clearance, then fix the s3 stud.
- b) Release the open gate adjusting stud s4, and move the tube guiding bar up or down, let the gate, which between the tube high level support plate and the tube guiding bar, have 1~2 mm clearance around the O.D. of the working tube, then fix the s4 stud.

5-3) Adjust the distance between two heads

Let the distance between two tube guiding plate be the work tube's length plus 1~2 mm clearance and make sure the work tube can smoothly move from the top of tube support plate down to the tube high level support plate.

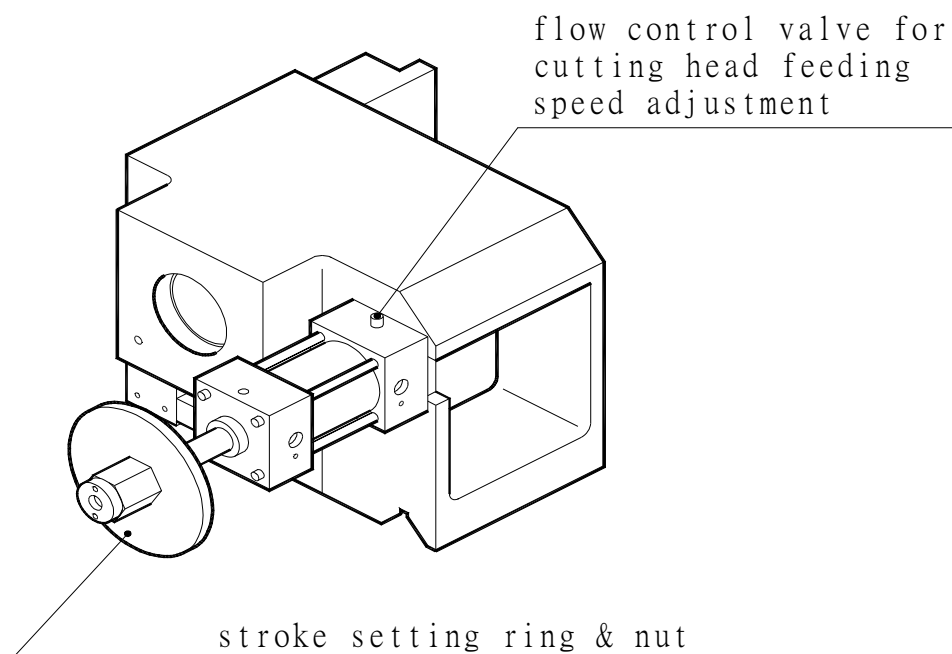
6. Adjust cutting head feeding speed & cutting stroke

6-1) Cutting head's feeding speed

According to the work tube's material & wall thickness, use different feeding speed. This feeding speed can be easily adjusted by turning the flow control valve. It is the proper feeding speed when the noise of the cutting sound is low and the cutting chips are not burned.

6-2) Cutting stroke

Adjust the tool head's forwarding stroke by setting the stroke setting ring and nut, which are showed in following drawing.



7. Replace cutting tool head & adjust cutting bits' position

7-1) Replace cutting tool head

According to the specific work tube's size, it needs to adjust the dedicated position of cutting bits. This job will take a little bit of time, so we suggest you to order the tool head from us for each size of work tube. The tool head will be adjusted in the correct cutting tools' position by our technical people.

To change the tool head, refer to the drawing on page 12.

Release 3 pieces of tool head fix screws, then easily take down the tool head. Replace a new head and attach to the seat, then tighten the fixing screws solidly.

7-2) Adjust cutting bits' position in tool head

In case you want to adjust the cutting tools' position, please be very pertinacious to do it. refer to drawing on page 12

Release 3 tool seat adjusting screws slightly.

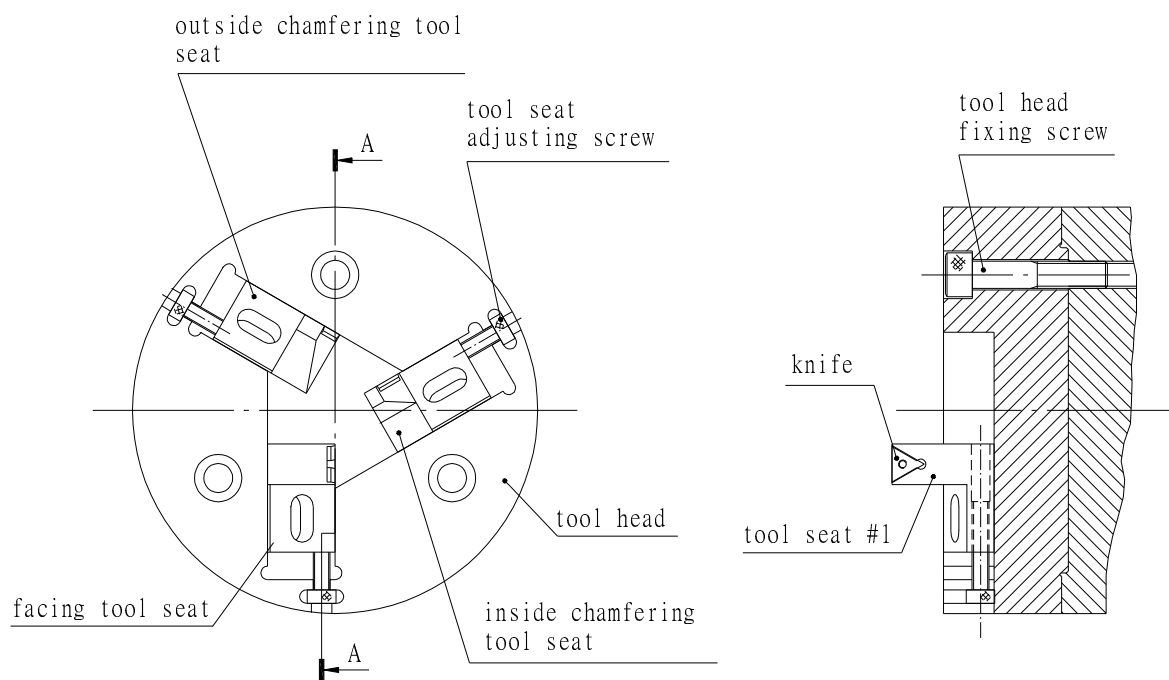
- a) Take one piece of work tube, put it against the front clamp jaw, and move it to approach the tool head to check the 3 tool bits' position.
- b) Move the tool bits forward to the center of the tool head by turning the tool seat adjusting screw clockwise, and counterclockwise to move it backward.
- c) Set the facing tool first, then set outside chamfering tool, then the inside chamfering tool.
- e) After fix the tool seats and tool bits, use manual operating function, clamp the work tube, start the motor, then feed the cutting head, do chamfering, return the cutting head. Check the chamfering result. Repeat a) to e) steps till you get good work result.
- f) There are two kinds of tools seats, one for tube O.D. from 3/8" to 1³/₈", the other for tube O.D. 1³/₈" and lager.

7-3) If the tool bits are worn, the tool head will vibrate during operation.

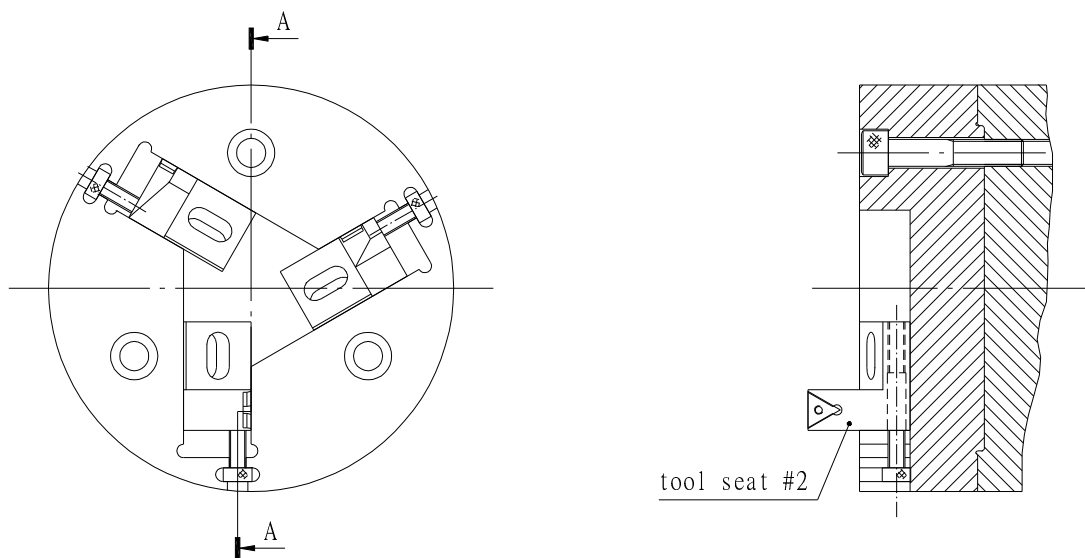
So it is necessary to check and replace new tool bits when the above situation happens.

NOTE !!

- (1) Each tool bit has 3 cutting edges can be used.
- (2) Standard tool bits and tool seats are for 30 degrees chamfer, you can order special tool seats and tool bits.



tool head with #1 tool seat



tool head with #2 tool seat

8. Properly work steps

Before cutting work,

- (1) make sure all the adjusting steps have been done.
- (2) make sure there are not any hand tools, work pieces etc. in the machine dangerous areas.
- (3) switch on electrical power and make sure the rotating direction of the spindle to be the same as the direction signed.
- (4) check and adjust the hydraulic system pressure in range of 30~35 kg/cm².

Before start auto-cycle cutting work, all the following manual operating steps should be tested.

- (1) M1 & M2 : on (position 1)
- (2) holding vice : forward (position 1)
- (3) holding vice : in neutral (position N)
- (4) clamp vice : forward (position 1)
- (5) holding vice : return (position 2)
- (6) tool head1 & tool head2 : feeding in (position 1)
- (7) tool head1 & tool head2 : return (position 2)
- (8) clamp vice : backward (position 2)
- (9) M1 & M2 : off (position 2)

After above all the manual operating steps have been tested O.K then test the auto-cycle operation.

NOTE :

- a) The cutting head feeding stroke has to be adjusted little by little, don't feed too deep in one try to damage the tool bits and the tube.
- b) It will be no function of the counter & the material exhaust, during semi-auto mode operation.

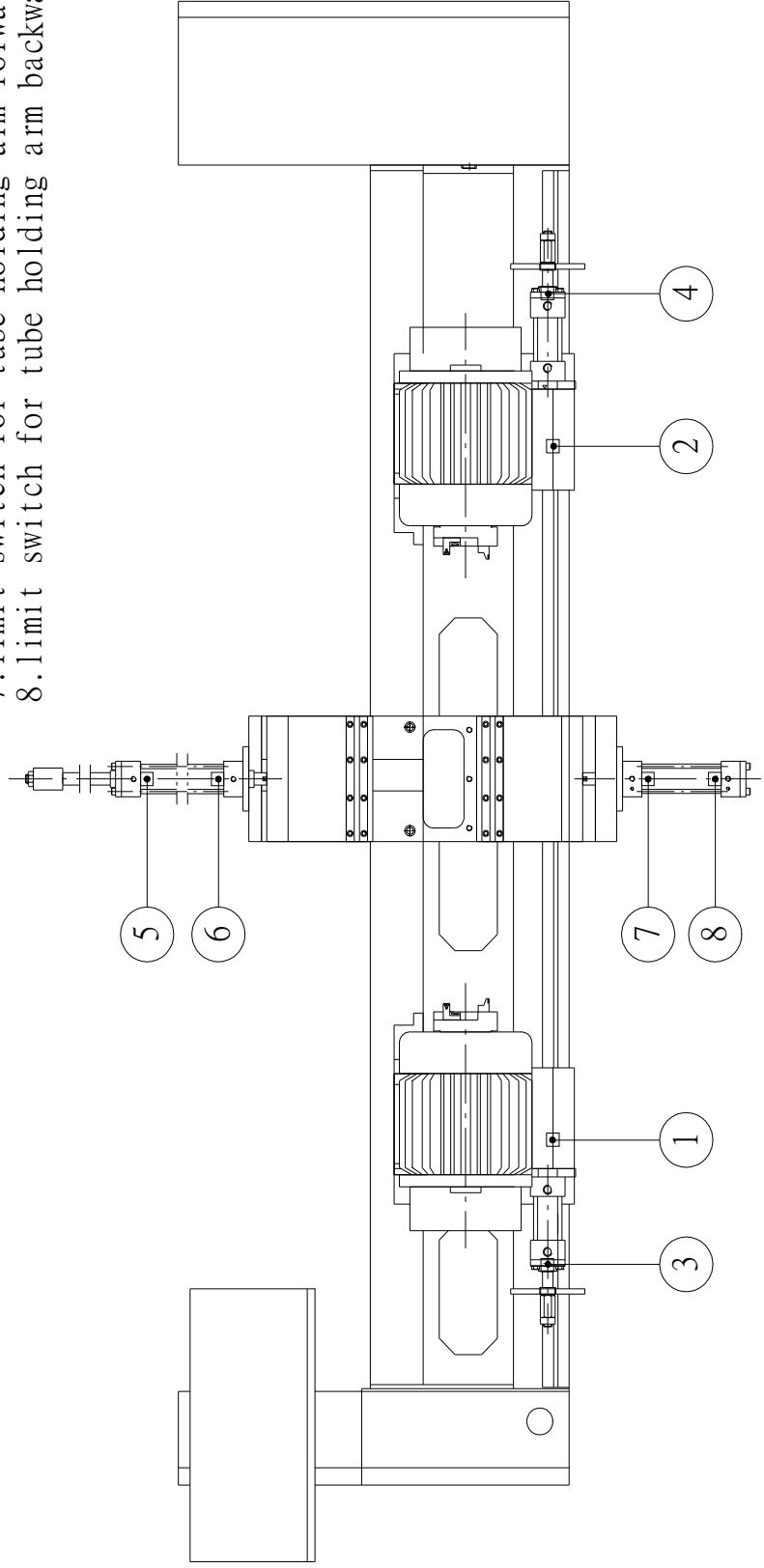
9. Maintenance

9-1) daily check.

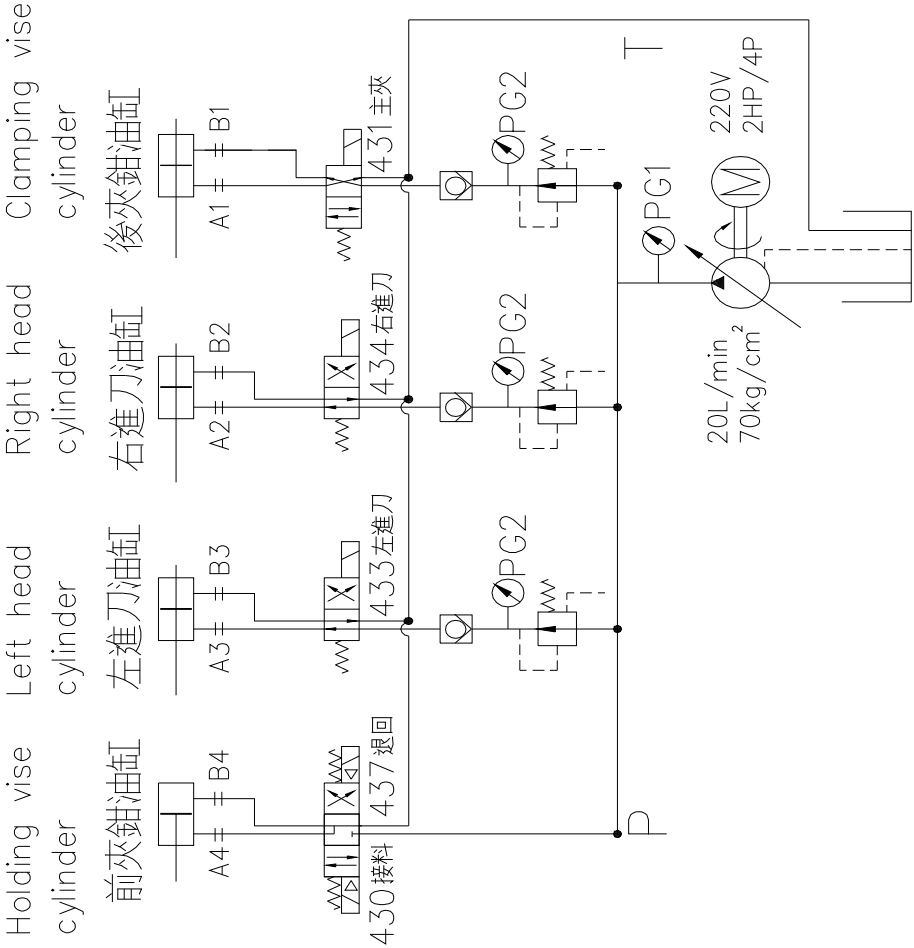
- a) Electrical power is properly connected.
- b) Hydraulic oil is in proper level.
- c) Right & left head lubricant oil cup is in proper level.
- d) Sliding way of clamp vice & holding vice are properly lubricated.
- e) All cutting chips are removed from the machine after daily work.

Position of sensors and limit switches

- 1.limit switch for left head backward
- 2.limit switch for right head backward
- 3.limit switch for left head forward
- 4.limit switch for right head forward
- 5.limit switch for clamp jaw backward
- 6.limit switch for clamp jaw forward
- 7.limit switch for tube holding arm forward
- 8.limit switch for tube holding arm backward

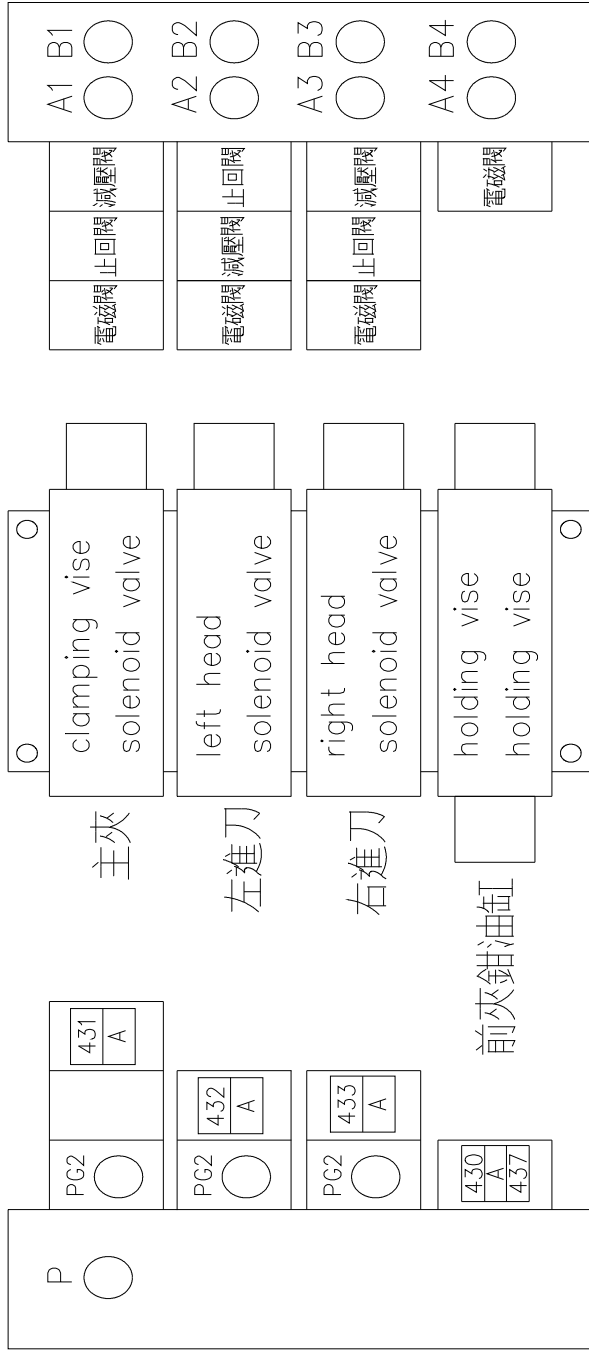
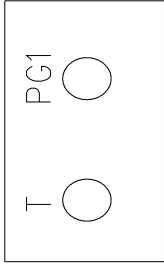


Hydraulic circuit diagram

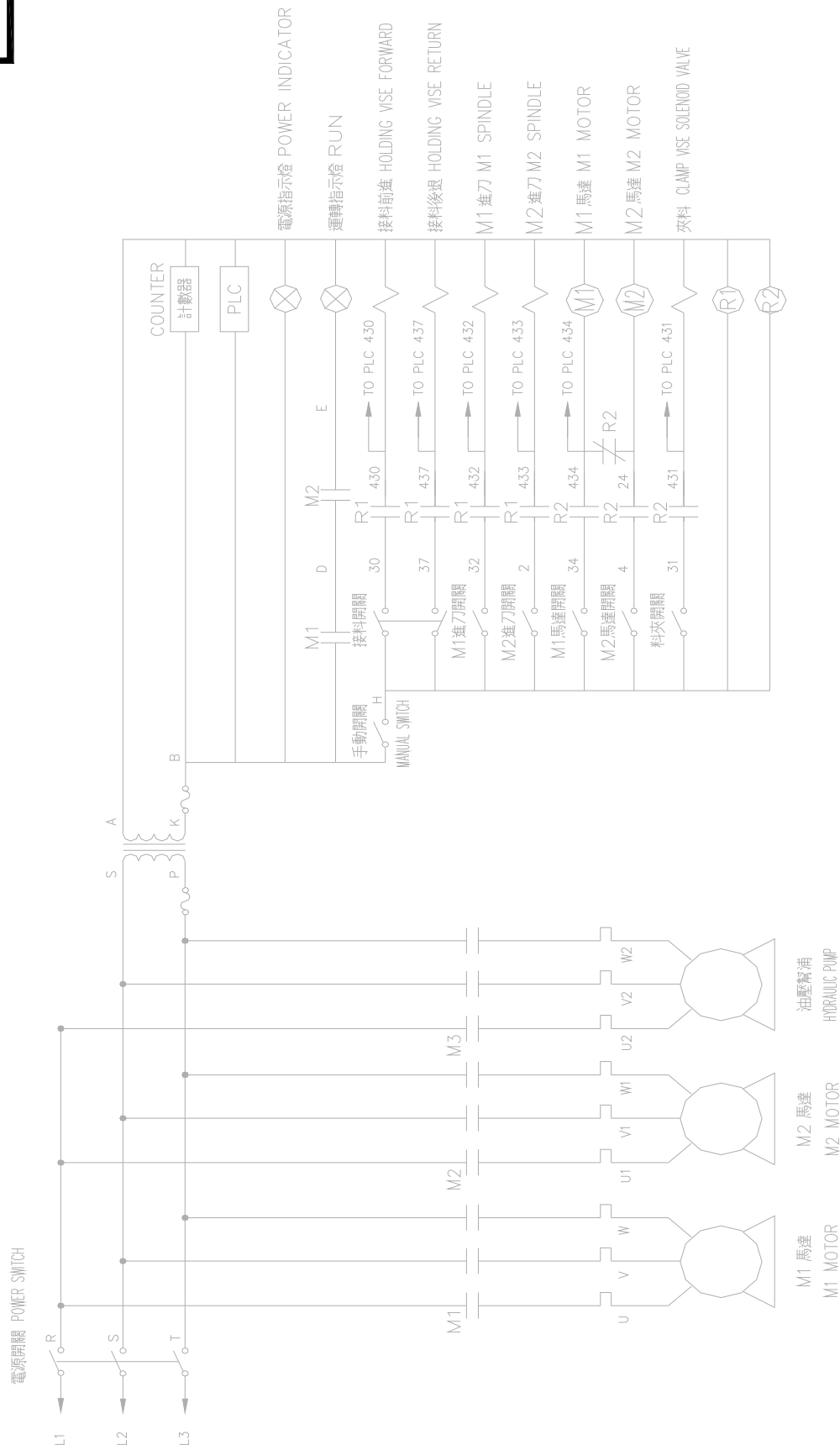


1					製圖	設計	審核	件號	E2HYD01	第三角法
2								圖名	油壓迴路圖	比例
3								機型	DEF-FA/60S	件/台
4								材質		圖紙
									和和機械股份有限公司	

Hydraulic elements' position drawing

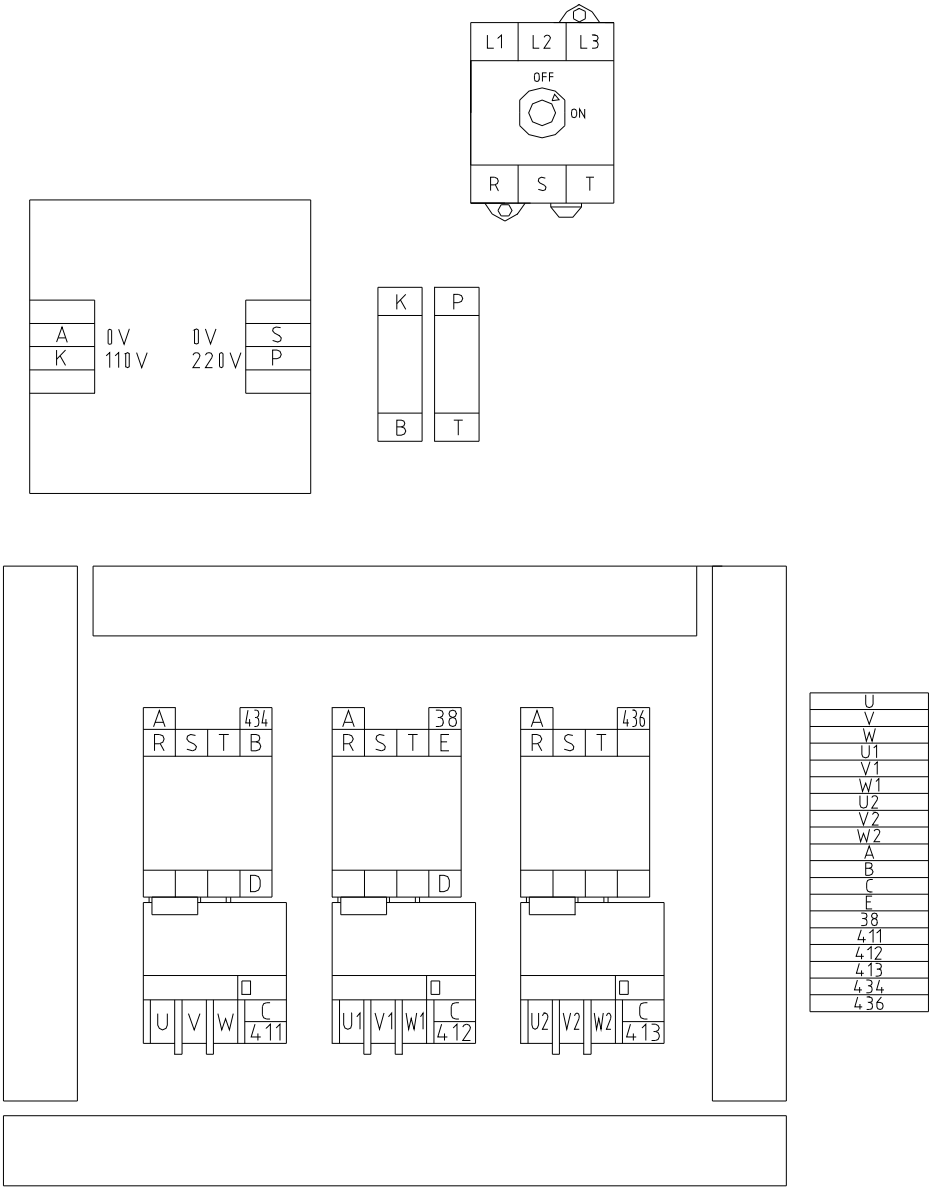


①			製圖	設計	審核	件號	E2HYD02	第三角法
②						圖名	油壓零件配置圖	比例
③						機型	DEF-FA/60S	件/台
④						材質		圖紙 A4
和和機械股份有限公司								

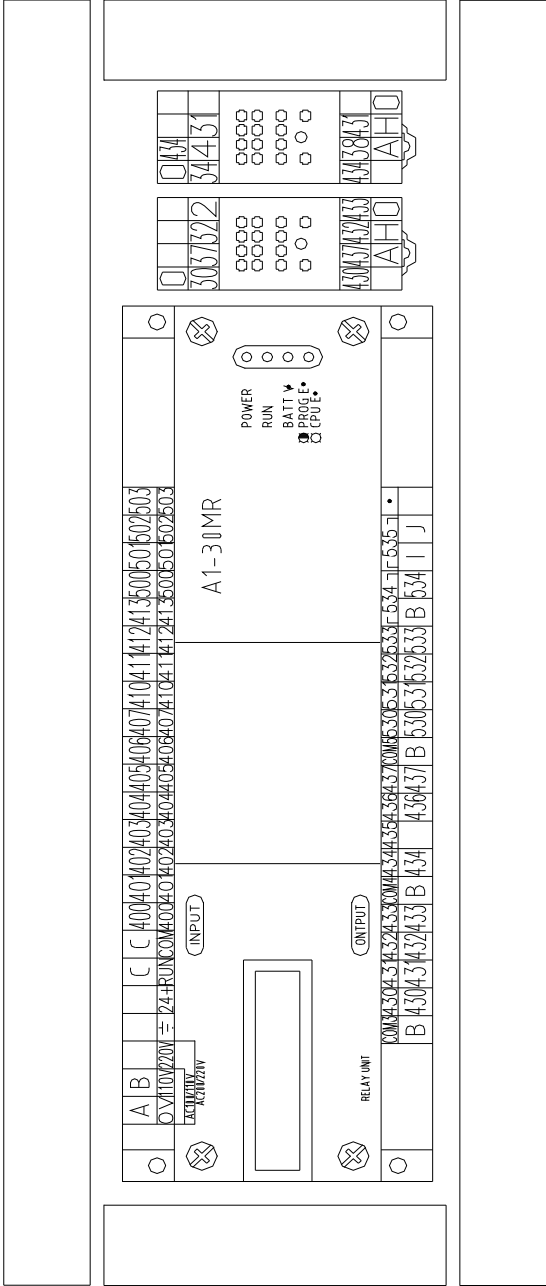


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2										圖名	主電路圖	比例			
3										機型	DEF-FA/60S	件/台			
4										材質		圖紙	A4		
和利機械股份有限公司															

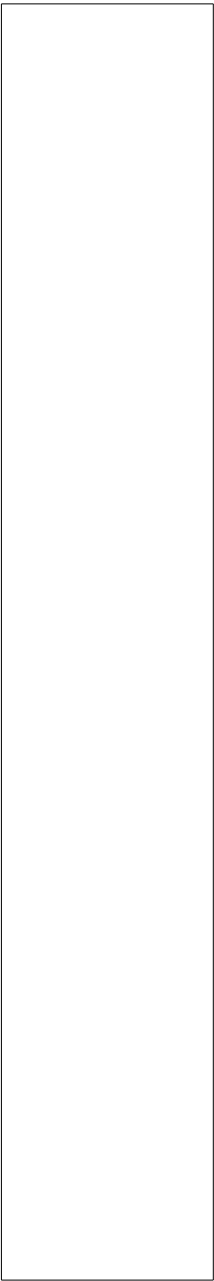
序號



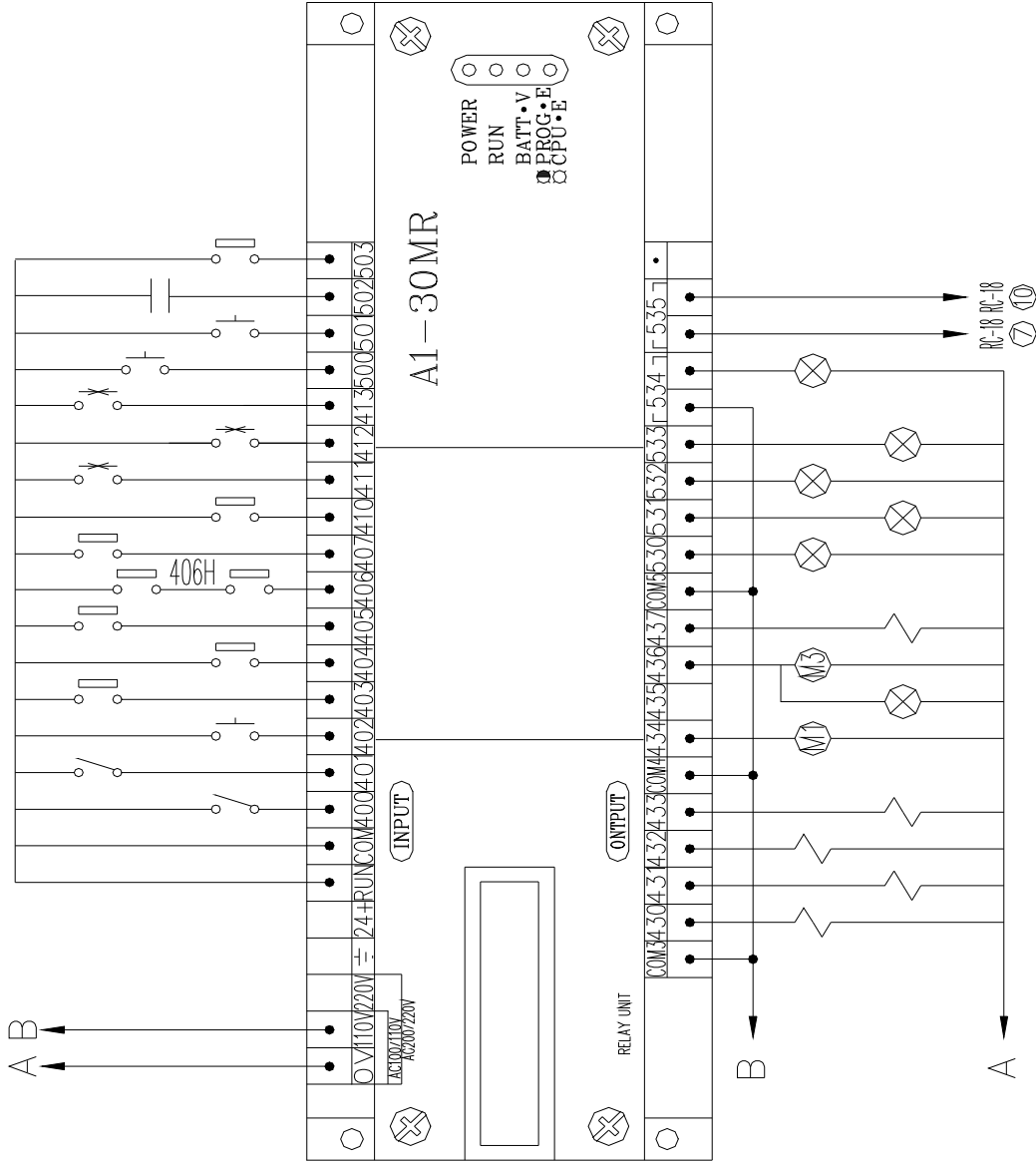
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②								圖名	動力盤配置圖	比例	
③								機型	DEF—FA/60S	件/台	
								材質		圖紙	A4
④								和利機械股份有限公司			



J		
I	E	
H	C	
A	C	
534	C	
533	C	
532	C	
531	B	
530	A	
502	A	
501	A	
500	A	
434	A	
413	503	
412	437	
411	436	
402	433	
401	432	
400	431	
38	430	
37	410	
34	407	
32	406	
31	406H	
30	405	
4	404	
2	403	



1 新圖	89013101歐陽景松	製圖	設計	審核	件號	E2VE05A1	第三角法
2		圖名	控制盤配置圖	比例	圖名		
3		機型	DEF-FA/60S	件/台	機型		
4		材質		圖紙	材質		A4
		和利機械股份有限公司					

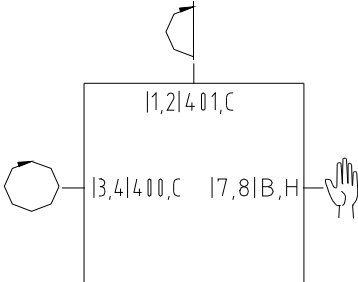
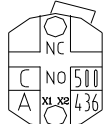
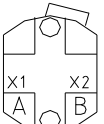
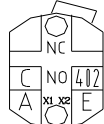
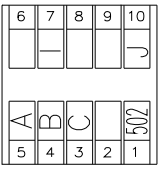
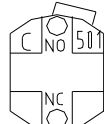
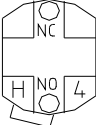
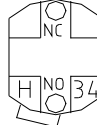
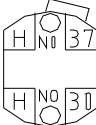
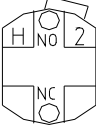
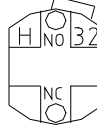
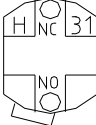


1	新圖	89013101	歐陽景松	製圖	設計	審核	件號	E2VE06A1	第三角法	
2							圖名	PLC配置圖	比例	
3							機型	DEF-FA/60S	件/台	
4							材質		圖紙	A4
							和和機械股份有限公司			

輸出	說 明
430	接料前進電磁閥
431	夾料電磁閥
432	M1 進刀電磁閥
433	M2 進刀電磁閥
434	M1, M2 馬達電磁開關
435	
436	油壓幫浦
437	接料後退電磁閥
530	無料停機燈
531	計數到停機燈
532	油壓過載燈
533	M1 馬達過載燈
534	M2 馬達過載燈
535	計數器 INPUT

輸入	說 明
400	全自動模式
401	半自動模式
402	啓動按鈕
403	接料前極限
404	接料後極限
405	M1 進刀前極限
406	M1, M2 退刀後極限
407	夾料後極限
410	M2 進刀前極限
411	M1 馬達過載
412	M2 馬達過載
413	油壓幫浦過載
500	油壓幫浦按鈕開關
501	緊急停止按鈕
502	計數器 OUTPUT<N.0>
503	夾料前極限

1	新圖	89013101歐陽景松	製圖	設計	審核	件號	E2VE07A1	第三角法
2						圖名	I/O表	比例
3						機型	DEF-FA/60S	件/台
4						材質		圖紙
							和和機械股份有限公司	

序號		背視圖				第三角法			A4	和和機械股份有限公司
		操作模式開關  油壓幫浦  電源指示燈 				件號	E2VE03A1	控制面板配置圖	比例	
		M2 馬達過載燈  M1 馬達過載燈  油壓幫浦 過載燈  無料停機燈  計數到停機燈  起動開關 				圖名	DEF-F A/60S	機型	件/台	
		計數器  緊急停止 				圖名				
		M2 馬達開關  M1 馬達開關  接料開關 				89013101	歐陽景松			
		M2 進刀  M1 進刀  料夾 								
1 新圖						2	3	4		

