QC12Y-8×2500 HYDRAULIC SHEARING MACHINE

OPERATION MANUAL

Shearing	Thickness:	8	mm
Shearing	Width:	2500	mm
Delivery	No.:		

OPERATION MANUAL

Contents

A. General

This operation manual delivered together with the machine is very important in guiding the user to use and maintain the machine correctly. Keep this manual properly. All operators and maintenance personnel must carefully read and understand the operation manual to ensure to use and maintain the machine correcting, then refer to the operation manual and operate the machine.

Satisfactory operations will be achieved if to do it according to the operation manual correctly. Because the information of the manual is based in our maintenance and operation of years.

Please connect with us in time when accrued questions can't shoot during this machine is used . (Please indicate model and serial No. of the machine)

Special note:

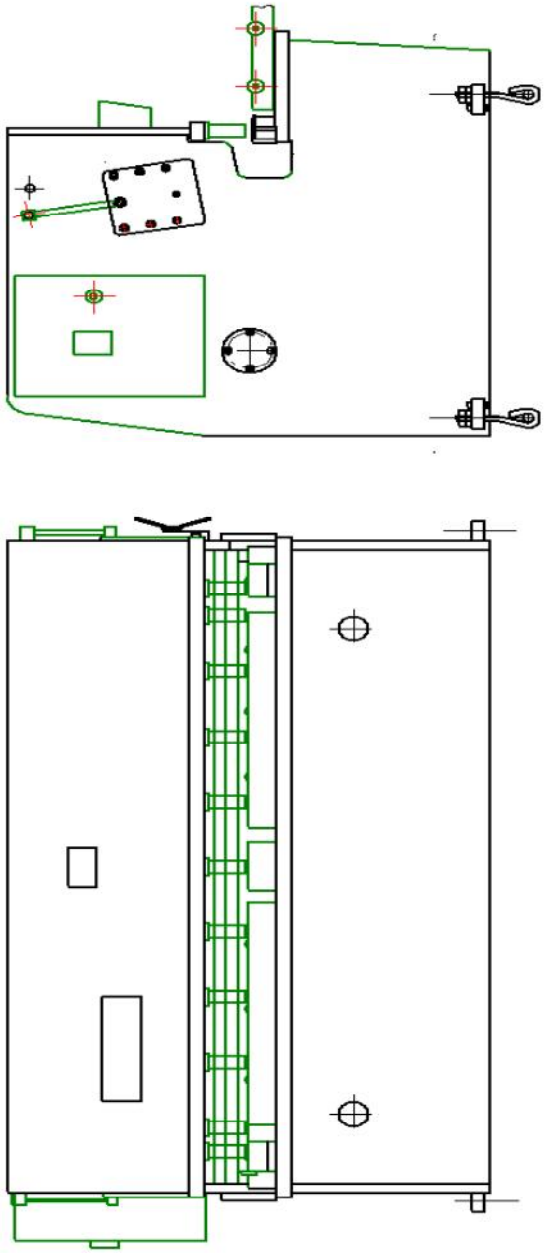
1. During operation, the protecting bar and cover of the machine in front or rear or beside can't be taken apart .Otherwise it is dangerous.

2. Have to fill air reservoir with nitrogen only and no any gases. Otherwise it can cause blast.

3. Oil pump can't rotate in the contrary direction, otherwise it can destroy oil pump. After the wire of machine is connected, presser start-button for two seconds in the first time of starting pump please ,then stop-button must be pressed at once. At the same time, observe the rotating direction of the oil pump. If the direction is contrary, user must repeat connecting the wire of machine, and repeat the above process. Until its rotating direction is the same direction as the indicate ding allowed by the pump.

Excuse me to in form you when we improve on this mode machine for the future.

B. Outline Photo of the Machine



C. Main feature of the machine

This machine is used for shearing steel plates with thickness of 1-8mm and width of 2500mm.

The strength of the plates to be shorn should be 450N/mm,If the plates of other strength are to be shorn, the thickness of them should be reduced.

This machine adopts the whole steel plate-welded structure,hydraulic driving, The nitrogen cylinder return is used. The machine is characterized.by smooth running, little noise, easy operation,good rigidity and high accuracy.

Adjustment the opening-blade clearance is quickly and simply,It has front and back gauge. The equipment of the back gauge is mechanical driven,There is a revolution indicator to show the value,and it can be manually fine adjusted easily and reliably.The front block is counted by the scale and fix position by block.It has installation for lights of cutting,it can random adjust top rest's stroke amount to improve working efficiency for cutting narrow plates.The grating is used as the protective device, The machine will stop working automaticly.

When the grating is opened,it is ensuring to operate safely.

D. Main technical specification and parameters of the machine

No.	Name		Numerical value	Unit	Remark
1	Max. shearing thickness		8	mm	Σb≤450MPa
2	Max. shearing Width		2500	mm	
3	Shearing Angle		2	°	
4	Stroke number		12	mm^{-1}	Including min. Short stroke
5	Backgauge rang		10-500	mm	
6	Speed of backgauge		50	mm/s	
7	Height of the work table		800	mm	
8	QTY hydraulic hold cylinder		13	Piece	
9	Oil Tank Capacity		250	L	
10	Weight		5.2	T	
11	Main motor power		11	kW	
12	Overall Dimensions	L	3150	mm	
		W	1620	mm	
		H	1710	mm	

E. Hoisting and installation of the machine

1. Hoisting of the machine

After the machine arrived model of he machine, accessories, spare parts cinch in reference to information should checked according with packing list. If find not right ,please keep in touch with us in time.

On top of the machine frame ,there are two hoisting hole (hoisting ear). They are used to hoist and install (See the machine hoisting drawing)

Select proper hoisting equipment and wirerope according with weight of the machine during hoisting and installation. Otherwise it will make accident of body and equipment.

2. Installation

Foundation must be prepared according with foundation plan of the operation manual before installation. Foundation depth is decided by user's earth condition, but not lower than 500mm.Grout is divided into two step. First step the machine is placed in foundation to correct horizontal initially and mount foundation bolts after 15 days: Second step after grout twice 48 hours, horizontal is corrected by a 0.05/1000mm gradient, then mount foundation bolts. Correcting horizontal, the gradient is placed on substrate of the bottom blade.

Note: After horizontal of the machine being adjusted and mounted, and before the machine being operated, gap of blade edges is adjusted max state and corrected blance according following step of H.6.

F. Fueling of the oil tank and lubrication of the machine

1 Fueling of the oil tank

The oil tank must be cleaned and washed and no any impurity and dirties before the machine is operated.

After being done, fill the oil tank with 46# hydraulic oil. The used oil must be clear and filtrated. The oil is filled to midline of fluid level.

It is advised not operate the machine in microtherm (Lower-5℃)and exchange hydraulic oil. The machine must be air run a long time in lower temperature. Install a heater in hydraulic system if needed.

The normal working temperature of oil is not higher than 75℃.Should install a cooler if the temperature of oil is too high.

2 Lubrication of the machine

Good lubrication is important; which ensures normal working of the machine and used life extended .It should be done according with the operation manual specificity range.

Main lubrication parts of the machine are:

Lithium grease should be filled regularly at the swing support shaft.

Lubrication point must be often checked, maintained, cleaned and washed.

G. Analysis of hydraulic system of the machine

The hydraulic system(figure 1) is mainly made of pump2,combined valve 3,overflow valve 3C,magnetic directional valve 3D.The whole system is reasonable.

The needed pressure oil is provided by pump2. The max working pressure of system is 18MPa.The return stroke of the top rest is finished by nitrogen cylinder8, and the fill pressure is about 5MPa.

The working principle of hydraulic system(see figure1) is:The oil carried from the pipes enters every working cylinder (main cylinder 7, swaging cylinder 9)and combined valve3 while the oil pump is working.After entering the combined valve,the oil is divided into main oilway and controlled oilway.The controlled oilway will enter magnetic directional valve 3d which is always “on” through the throttle hole to the oil tank. And pressure is formed.Because of the throttle hole 3,certain pressure difference is formed.

The pressure to the oil-in through the cone valve 3b will be higher than that at the controlled side.And then the cone valve 3b will open after overcoming the effect of the spring.The oil will come back to the oil tank through the return oilin and main oil route also doesn't form any pressure. so the machine will make no action.When the magnetic directional valve is switched on,the controlled oil will enter the overflow valve 3c through the magnetic directional valve.So The overflow valve 3c is closed under the adjusted pressure,that the oil route pressure will increase bit by bit.The pressure is the same on each side of the taper valve 3b.But it is closed owing to the area difference of the valve pith and the effect of

spring,hole-down cylinder 9 will press down first after overcoming the pulling force of the spring and later. The top rest moves down after the main oil cylinder 7 overcoming the supporting force to return. At this time the hold-down cylinder 9 and top rest beam will work in order in the short time. The top rest moves to the up-limited point. The dot makes the directional valve 3d power off and restore to the throne.The whole oil route is unloaded. The hold-down cylinder 18 will come to the original position because of the effect of the spring.

Failure and Remotion of hydraulic system

Apperance of damage	Reasons	Way of remotion
The oil line is formed without pressure, And No action of the top rest.	the Magnetic Directional valve's electric plug not touch well	Examine and repair the Electric plug
	The pith of the Magnetic Directional valve is blocked up or coarse. And there is no operation. The valve pith of the combined valve has sundries at the mouth of the sealing washer, There is no sealing effect. The throttle hole of the combined valve is blocked up.	Examine, strip and clean.
The return of the top rest is slowly or can't return to top dead point, Top rest and swaging cylinder can't work harmoniously	Nitrogen pressure of nitrogen cylinder is not enough Magnetic valve isn't arriving position	Fill the Nitrogen cylinder to increase pressure. Check the magnetic valve

H. Operation of the machine

1 Operation step:

1.1 Put electric box switch to “1” position to be powered.

1.2 Push start button to start main motor. Check the direction of the rotating motor is same with the pump direction arrow indicated or not. If no same, should change .Otherwise the pump is dingoes. If there is air in pipes, idea of exchanging pushing start button and stop button is used .Repeat times and air discharges, then make oil pump run normally.

1.3 Adjust gap of blade edges according with cutting plate thickness. Indicated chart, the value is stranded for cut plate thickness (to steel). If cutting stainless steel, the gap of blade edge can reduce properly, it is about 0.6-0.65 times of common steel.

After last preparing work being finished, cutting can be formal start.

When push red emergency stop button when the machine occurs fault or needs to stop.

4 Adjustment of blades clearance

Logical blades durance must be selected according to cut plate in order to gain high quality cutting surface .This machine has quick adjusting device for blades clearance. Blade clearance is adjusted very easy. It is advised adjusting blades clearance by the following way .

It is adjusted base according with tensile strength σb=370-400N/MM, extend rate δ=35% mild steel;

Select blades clearance according with plate thickness 8% for tensile strength σb=370- 400N/mm mild steel. It is adjusted by installed left side of the machine or over left front of the machine handwheel. Red pointers aim to 1,is 1mm plate act and so on.

Blades clearance should be greater than corresponded plate thickness mild steel for lower extend rate mid and high carbon steel idiographic value is depended on plate extend rate and experience .

Blades clearance is depended on its extend rate when stainless steel plate is cut. It is advised not refer to tensile strength because of some stainless steel extend rate higher than same strength high-carbon steel.

Blades clearance should be appreciably smallness when plastic material is cut, while it should be great a lot when brittleness is cut .

5 Blades change and whet

Blades must be whetted timely. Damage equipment and can't gain good cutting quantity if cutting plate is continuous doing after blades cut blunt, Because of super pressure making outside brilliant granule structure destroy. Destroyed brilliant granule outside can be cleaned after blades whet. So a set of completed blades whet time table can be made according to idiographic producing to avoid to affect producing .

Advise using following time table :

Change edge after working 80-100 hours.

Change blade whet after working 320-400 hours .

Upper and lower blades of the machine each has four edge to use.

Thus use life is very long.

Last time table is use in normal working shears. Blades whet is Min. and life is longest if refer to this time table.

After blades whetted or changed ,blade clearance must be renew checked and adjusted.

6. Adjustment of blade clearance (after blades whetted or changed)

Upper blade position has been adjusted before away this manufactory. It is best not to change it. Blade is acclivitous state along verticality surface. That is, blade is backward acclivitous from top toward bottom.

Blades clearance needs to be adjusted in the following condition.

a. After blade working 80-100 hours and changing edge.

b. During new mounting whetted blades.

7. Backgauge device

Control of the backgauge device

The backgauge device of the machine is controlled by electric and fined adjustment manually.

The top blade must stay in upper dead point ,which can make backgauge move. Its movement is transferred by a motor and a group of gears. A counter which indicates gauge distance and controlling buttons are instated in operating panel over the machine.

It is fined adjustment by the help of handwheel.

During backgauge adjusted, can make it move from rear to front to smooth out tolerance because of gas of screw threads .

I. Safety maintenance and trouble shooting

Hydraulic system

1. hydraulic circuit

1.1 Time ,check oil position of oil tank. If it is lower than midline of fluid level, should fill tank with oil at once.

1.2 First the machine is operated 500 hours, must exchange oil. Aftertime oil are exchanged due to working 2000 hours.

1.3 Used hydraulic oil tank must be cores pond with requirement.

1.4 After each exchanging oil, the oil tank must be cleaned and washed thoroughly.

2. oil filter

2.1 Time oil filter lied in suction of the oil pump is cleaned and washed for petrol or trichloroethylene.

2.2 After first it is used for 8 days, it should be cleaned and washed. Aftertime it will be done once per month.

2.3 Must be exchanged in time if it is damaged.

3. Air filter

3.1 Air filter has installed on the oil tank cover.

3.2 The first clean and wash is done after having be used 60 days. Aftertime it must be cleaned and washed once per working 120 days .

3.3 Washing must be used for petrol or trichloroethylene.

J. machine's wearing parts list

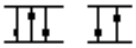
Order Number	Code number	Name and ordinance	Quantity	Material	
1	02.01	Upper blade	4	6CrW2Si	
2	02.02	Lower blade	4	6CrW2Si	
3	05.03	Pressing cylinder	16	assembly	
3					
4					
5					
6					
7					

K. Electrical System of Machine

1.Re:oil pump start-up and stop

Power the machine (3～380V 50Hz)up, open the key switch ( )  ıke the power indicator shining(). Then press start button SB3(),in order to start-up the oil pump, When press the emergency stop button SBO( Operation panel front), SB1(foot switch), SB2(panel front). The oil pump will stop immediately.

2. Re: to select machine status()

To locate key switch SA3 at " O" is for adjusting status; to locate key switch SA3 at "O" is for working status. 

3.Re: to select working way under working status

1) single()

After locating SA3 at "  ", Tread pedal switch SF, the blade adapter will move down, until get to the settled position, then if will automatically move back up to the upper limited position and stop.

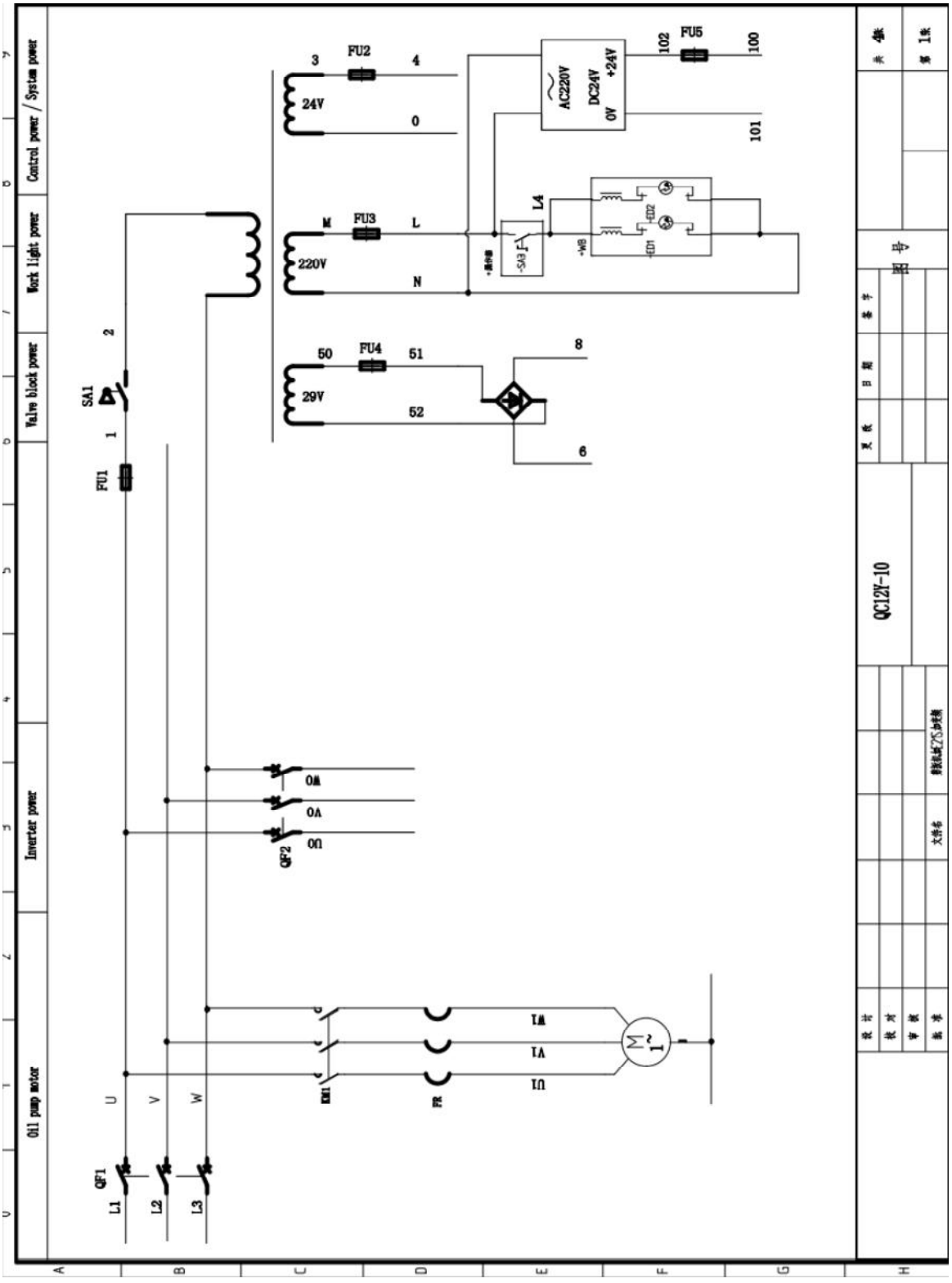
When machine is in "INCH", press footswitch SF, knife can return to top deep point automatically.

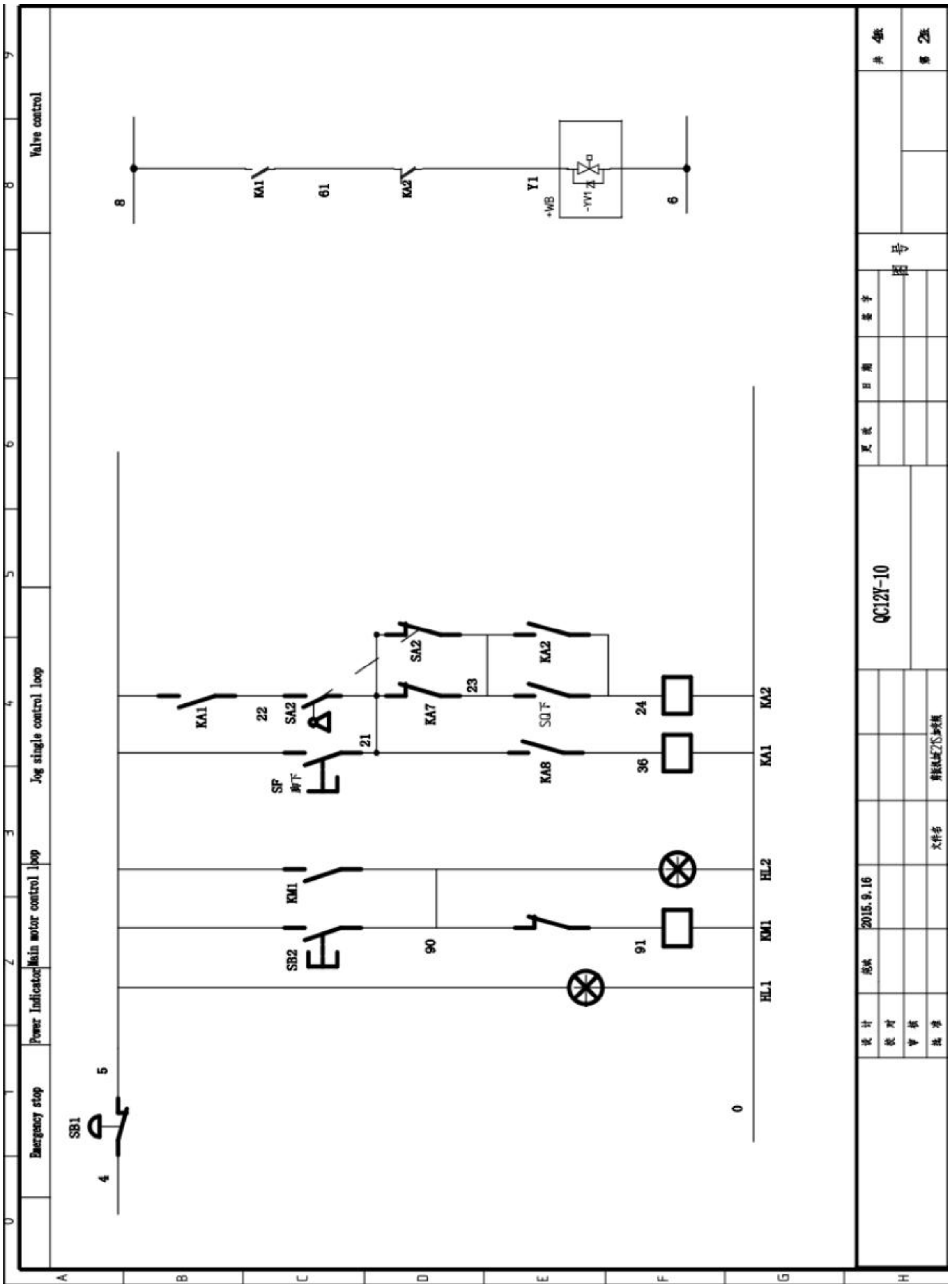
2)continuous()

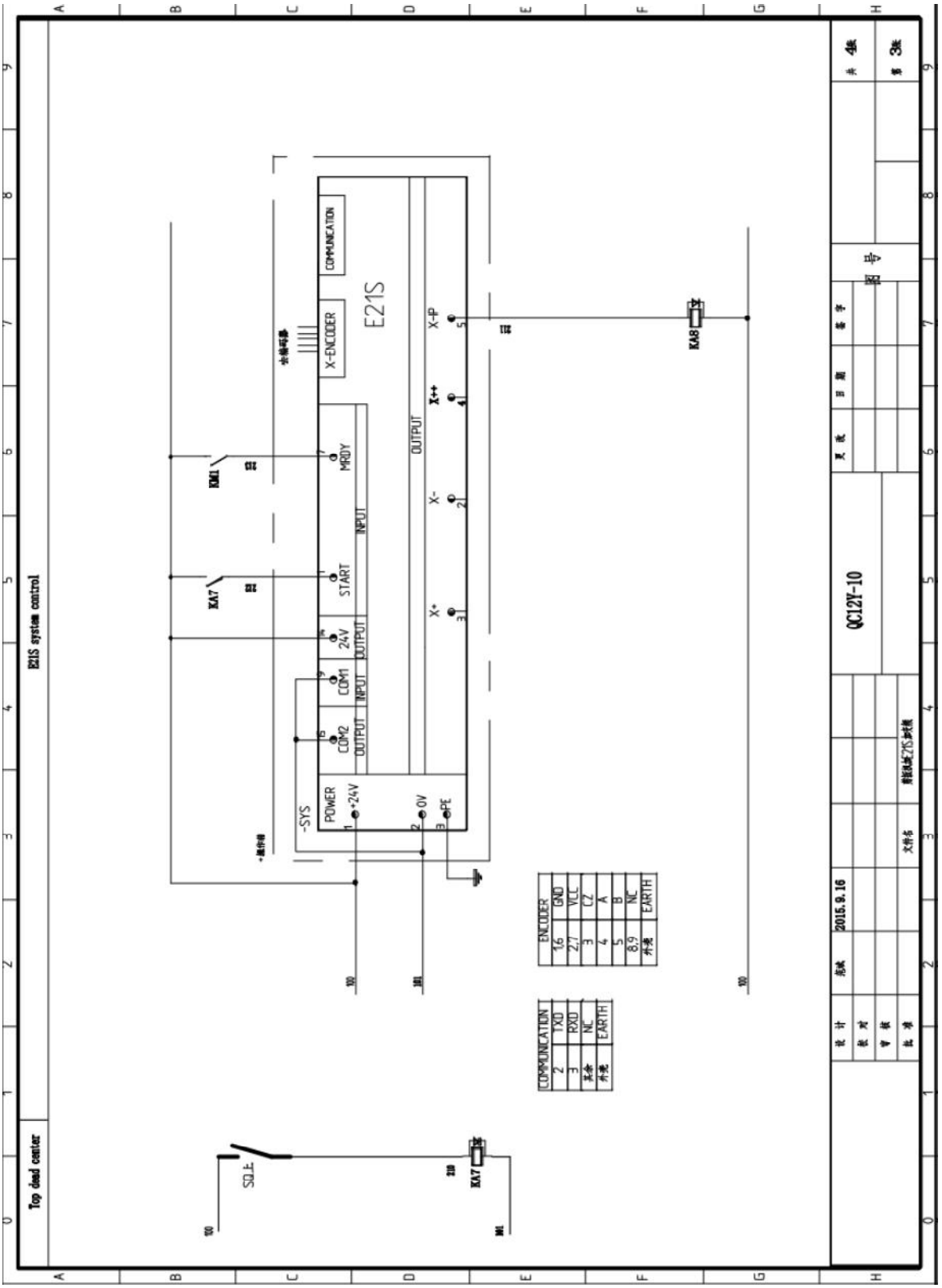
Adjust SA3 to  , press footswitch SF, knife rest press down, when it reach pre-set position, then it works continuously, and adjust SA3 to "inch", machine can stop continuous working.

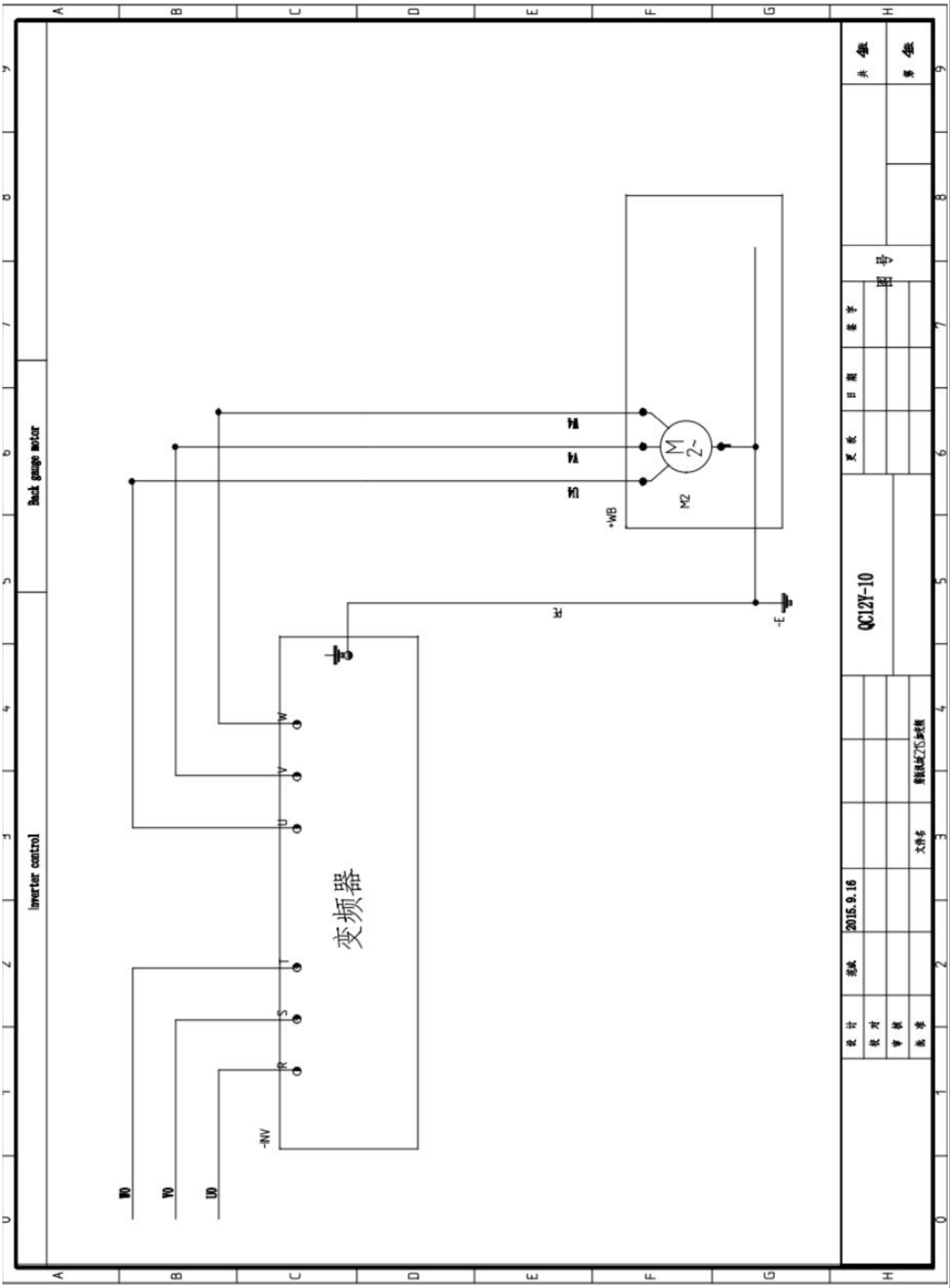
4. Re: emergency stop

It is necessary to stop the machine immediately when something urgent takes place, If so, Just push anyone of the 4 mushroom-type switches fixed on panel, emergency stop is achieved and the blade agape will move up to the upper limited position.


Control power / System power
Work light power
Valve block power
Inverter power
Oil pump motor
FU2
FU5
FU3
FU4
FU1
SA1
QF1
QF2
L4
AC220V
DC24V
+24V
0V
24V
220V
29V
QC12Y-10


Valve control
Jog single control loop
Main motor control loop
Power Indicator
Emergency stop
SB1
SB2
KM1
KA1
KA2
KA7
KA8
SA2
HL1
HL2
Y1
QC12Y-10
2015.9.16


E21S system control
Top dead center
E21S
COMMUNICATION
X-ENCODER
MRDY
START
24V
COM1
COM2
POWER
+24V
0V
PE
-SYS
OUTPUT
INPUT
X+
X-
X++
X-P
KA1
KA7
KA8
SQ止
ENCODER
16 GND
2.7 VCC
3 CZ
4 A
5 B
8.9 NC
EARTH
COMMUNICATION
2 TXD
3 RXD
NC
EARTH
2015.9.16
QC12Y-10

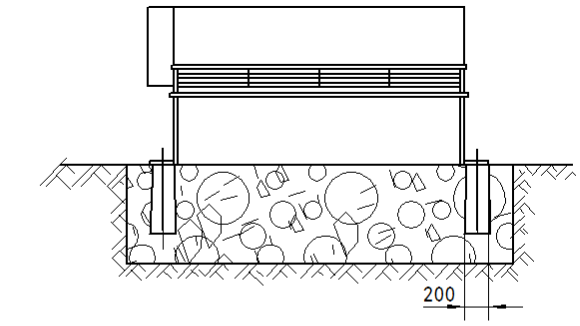


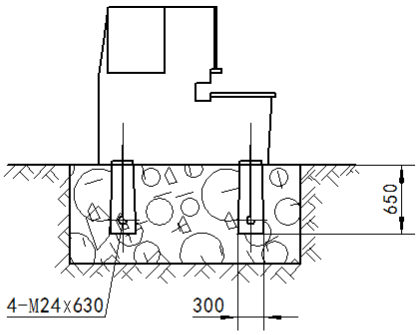
Back gauge motor
inverter control
变频器
M2
+WB
-INV
PE
-E
U
V
W
R
S
T
QC12Y-10
2015.9.16

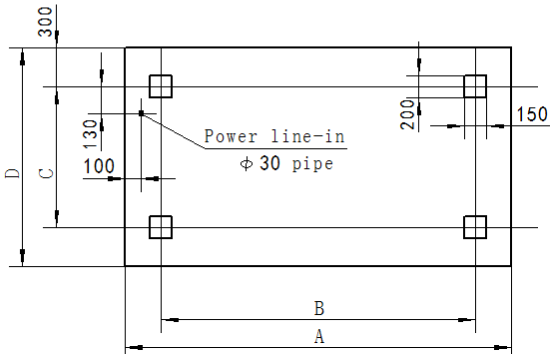
L. Foundation diagram

1.Installation and mounting of the machine is according with normal rule of grout twice.

2.Confirm of foundation depth is according with user's earth condition, but it is not lower than plan's size.

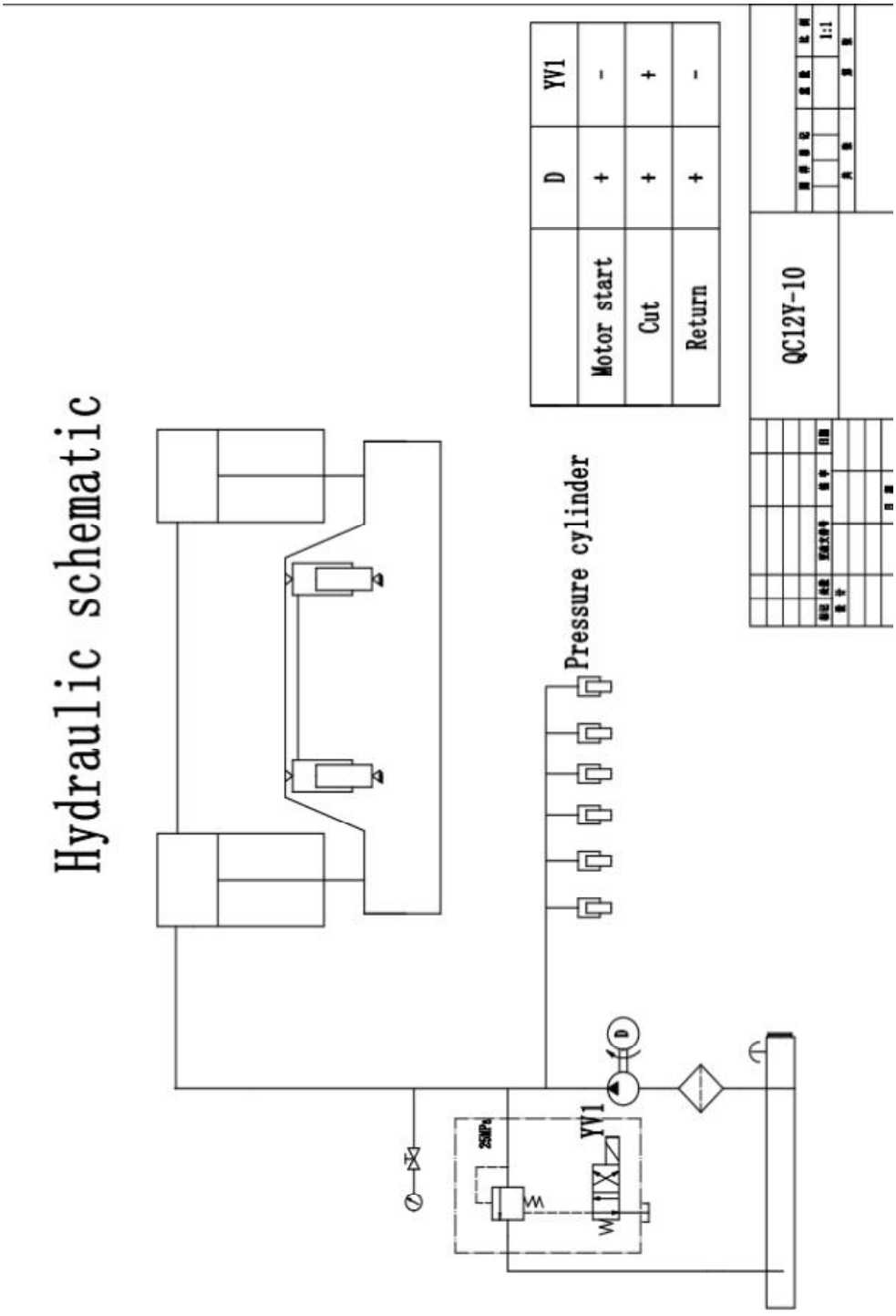






Product / dimension	2000	2500	3200	4000
A	3000	3500	4200	5000
B	2330	2880	3582	4382
C	1150	1150	1250	1500
D	1900	1900	1900	2250

NOTE:The depth of the foundation depends on soil texture


Hydraulic schematic
Pressure cylinder
YV1
D
Motor start
Cut
Return
QC12Y-10