



# OPERATOR'S MANUAL

Metal Working



Book 2 of 2

## HYDRAULIC SHEAR MODEL: SH-120500-HD

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Rev. 09/2019



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## LUBRICATION AND MAINTENANCE



**WARNING:** Make sure the electrical disconnect is OFF before working on the machine.

Maintenance should be performed on a regular basis by qualified personnel.

Always follow proper safety precautions when working on or around any machinery.

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- On a weekly basis clean the machine and the area around it.
- Lubricate threaded components and sliding devices.
- Apply rust inhibitive lubricant to all non-painted surfaces.



*Note: Proper maintenance can increase the life expectancy of your machine.*

### Machine Lubrication

The main lubricating positions of machine:

Cutting Beam roller bearings	Calcium-based grease	2000 hours
Rolling surface of rollers and guides	Calcium-based grease	40-50 hours
Lead screws, chain and guiding groves	Calcium-based grease	40-50 hours
Exposed wear surfaces and bare metal parts	Calcium-based grease	40-50 hours

### Blade Changing and Grinding

It is very important to grind the blade edges regularly. Long time use of blade, with no grinding, will increase the cost of grinding, and shorten the blade life as a whole. Continuous shearing with blunt cutting edges, will cause the outer crystal grains of the blade to be damaged under the excessive pressure.

Through the grinding of cutting edges, the outer layer of the damaged crystal grains can be removed. For this, a schedule for blade edges grinding should be made based upon actual production material and schedule.

The following schedule for cutting edge grinding is recommended:

- Cutting edge change after 80-100 working hours for blade;
- Cutting edge grinding after 320-400 working hours for blade. There are 4 cutting edges for the each of blades equipped on the machine.



- The schedule recommended above is only to be used for the shears put into normal operation. If the cutting edges of blade are arranged for grinding following the schedule, the removal quantity of blade would be minimum, and its lifetime be maximum possible.
- After the edge grinding or replacement of blade, the blade clearance has to be re-inspected and readjusted.

### **Hydraulic System**

- Inspect the oil level of tank regularly. If the oil is below the mid-line of oil level, replenish the tank immediately.
- The first oil change has to be made after 500 working hours. Afterwards oil change is to be made regularly whenever the machine has worked for 2000 hours.
- Clean the oil suction filter after the first 40 hours of operation and then follow the hydraulic oil changing schedule.
- Clean the hydraulic breather cap after the first 40 hours of operation and then follow the hydraulic oil changing schedule.
- It is recommended not to work below 23°F (-5°C) or above 167°F (75°C). In cases where the temperature is very low, running the system at idle for several minutes will warm the oil. If needed, install a heater in the hydraulic system to warm the oil, or a cooler if the temperature is too high.

### **Changing Hydraulic Oil**

The hydraulic oil is the primary medium for transmitting pressure and also must lubricate the running parts of the pump.

Cleaning of the oil tank is very important. Proper hydraulic operation depends upon clean hydraulic oil and a clean hydraulic system.



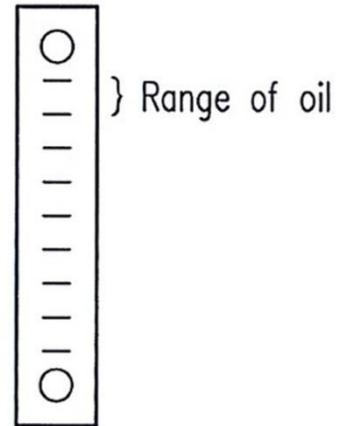
**Important:** *Used oil products must be disposed of in a proper manner following your local regulations.*

1. Remove the center (and right if desired) front cover to access the reservoir.
2. Have a container capable of holding at least 35 gal. (132L) available to drain the tank into.
3. Using the drain plug at the front of the tank or a siphon pump through the top of the tank, empty the tank into the container and recycle according to local standards.





4. Remove the top cover and clean the hydraulic tank and re-install the top cover.
5. Use hydraulic oil #68 SHELL BRAND or an equivalent with similar specifications to fill the hydraulic tank until it reaches the midpoint on the sight gauge.
6. Keep hydraulic reservoir filled to 90% of capacity.
7. DO NOT rely totally on the oil gauge as they can sometimes indicate an incorrect level reading. Do a visual inspection with the oil fill cap removed as well.
8. A shortage of hydraulic oil will cause hydraulic system breakdown to major mechanical components due to overheating.
9. Change the hydraulic oil and clean the suction filter after the first 500 hours of operation. Thereafter the hydraulic oil and filter should be changed at 2000 hours or annually.



Oil gauge



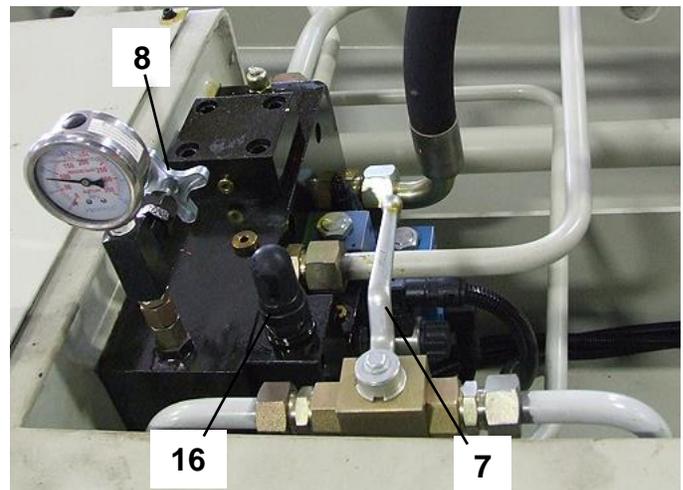
## Hydraulic Pressure Filling the Accumulator

**NOTICE:** This is not a common function. The accumulator has been charged from the factory and will not require charging unless someone has tempered with or inadvertently actuated the accumulator hydraulic circuit ball valve. The accumulator will only require hydraulic pressure filling if the hydraulic pressure gauge is below 8MPa AND the shearing ram will not lift and hold at the full up position.



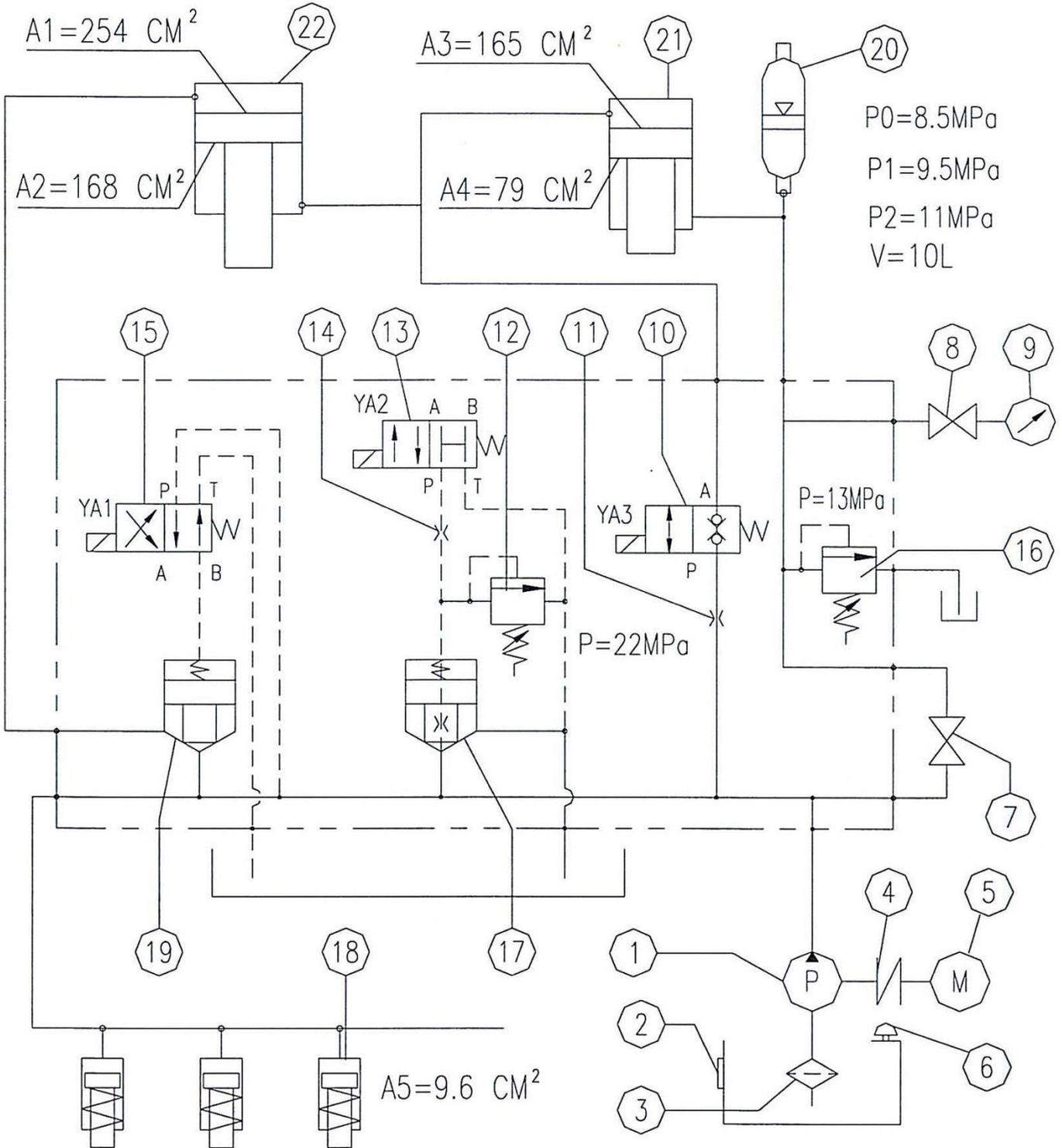
**Note:** This operation requires two people to be able to reach switches and valve at the same time.

1. Open the shutoff needle valve #8 to allow pressure to the pressure gauge.
2. IF THE SHEARING RAM IS NOT ALL THE WAY AT THE BOTTOM OF ITS TRAVEL, OPENING THE BALL VALVE #7 WILL CAUSE THE RAM TO FALL. Open the shutoff ball valve #7 slowly allowing the ram to lower to the bottom position.
3. Start the pump and place the stroke key switch in the left jog stroke position.
4. Place the accumulator switch in the right "1" position. This will energize the YA1 and YA2 valve.
5. Adjust the relief valve #16, until the oil pressure of accumulator is at 11MPa, this is the P2 value as shown on the hydraulic diagram.
6. Close the shutoff ball valve #7. Then turn the accumulator switch to the "0" position. The cutting beam will raise by the pressurized oil from the accumulator.
7. Close the shutoff needle valve #8. This will prevent the pressure gauge from feeling any pressure spikes during normal operation.





# HYDRAULIC SCHEMATIC





### Hydraulic Engagement Chart

	YA1	YA2	YA3
		+	
			+
	+	+	+
	+	+	

### Hydraulic Parts List

Item	Code	Name	Qty.	Remarks
1	DVQ25-32FRAR-02	Oil Pump	1	KCL
2	TS-5	Fluid Level Sight Gauge	1	
3	WU-800x100-J	Suction Oil Filter	1	
4	CL-110	Coupling	1	
5	Y2160L-4-15kW	Motor	1	220V 3ph, 60hz
6	QUQ-20x1.0	Air Filter/Breather	1	
7	DC13-G1/2	Ball Valve	1	
8	DCT-02	Shutoff Valve	1	
9	AT-63-250K-A1-T-02	Pressure Gauge	1	
10	WSM06020W-01-C-V-24DG	Solenoid Valve	1	WANDFLUH
11		Throttle Valve	1	
12	DGMC-3-PT-GW-41	Pressure Valve	1	VICKERS
13	DG4V-3S-0B-M-U-H5-60	Solenoid Valve	1	VICKERS
14		Throttle Valve	1	
15	DG4V-3S-2A-M-U-H5-60	Solenoid Valve	1	VICKERS
16	DBDS6P-1X/200	Pressure Valve	1	REXROTH
17	LC25DB05A-7X	Two-Way Cartridge Valve	1	REXROTH
18		Clamping Cylinders	17	
19	LC25A05D-6X	Two-Way Cartridge Valve	1	REXROTH
20	NXQ-L10/31.5-H	Accumulator	1	
21		Right Cylinder	1	
22		Left Cylinder	1	

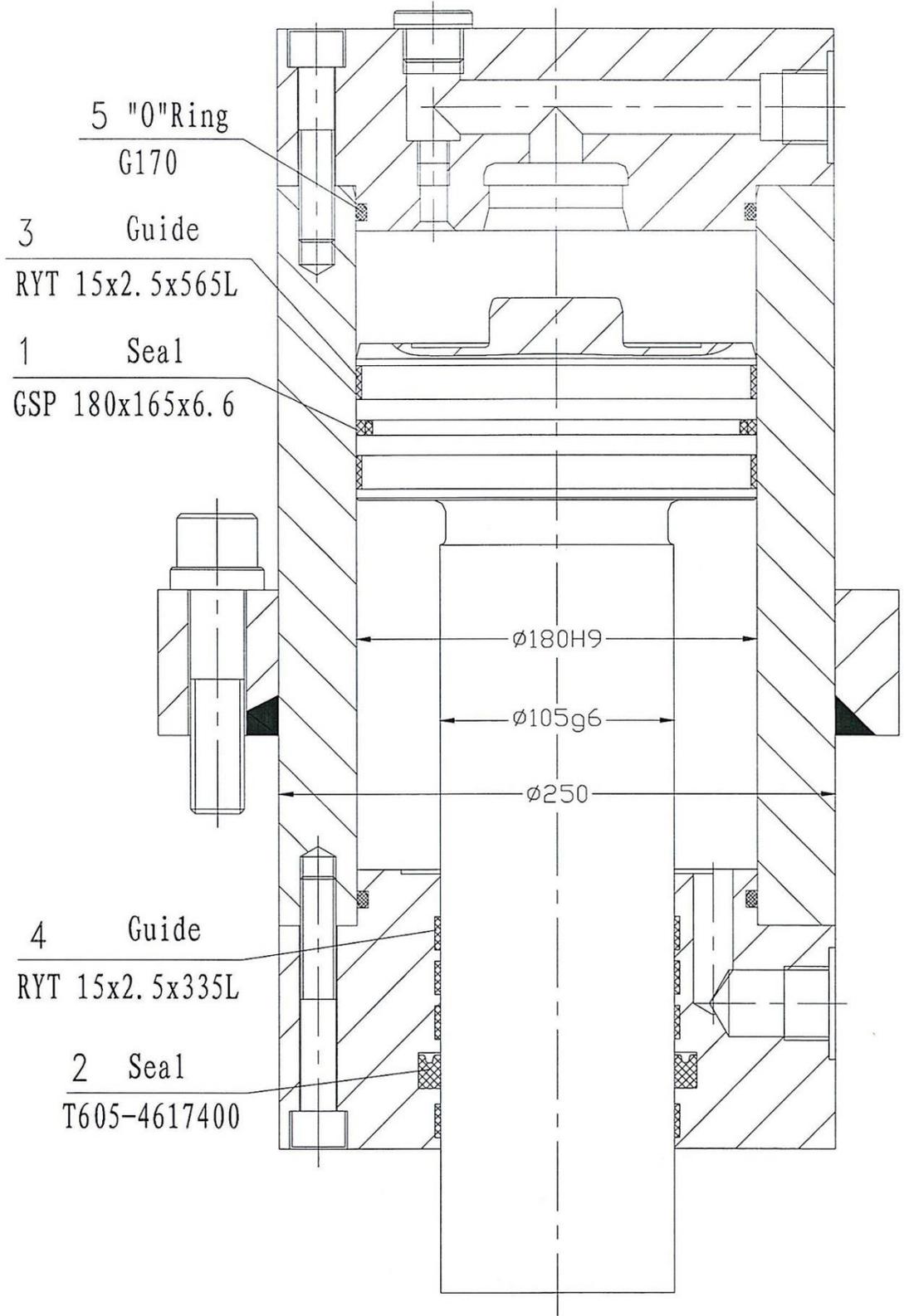


**List of Hydraulic Wear Parts**

No.	Specifications	Name	Qty.	Position	Remarks
	GSP 180x165x6.6	Rod Seal	1	Cylinder-L	REDUX
2	T605-4617400	Rod Seal	1	Cylinder-L	Hallite
3	RYT 15x2.5x565L	Guide Bushes	2	Cylinder-L	NOK
4	RYT 15x2.5x335L	Guide Bushes	4	Cylinder-L	NOK
5	G170	O-Ring	2	Cylinder-L	
6	GSP 145x130x6.6	Rod Seal	1	Cylinder-R	REDUX
7	T605-4617400	Rod Seal	1	Cylinder-R	Hallite
8	RYT 15x2.5x445L	Guide Bushes	2	Cylinder-R	NOK
9	RYT 15x2.5x335L	Guide Bushes	2	Cylinder-R	NOK
10	G145	O-Ring	1	Cylinder-R	
11	G140	O-Ring	1	Cylinder-R	
12	G60	O-Ring	17	Hold down-CY	
13	USH 35x45x6	Rod Seal	17	Hold down-CY	NOK
14	RYT 10x2.0x110L	Guide Bushes	34	Hold down-CY	NOK
15	Ø70x23	Protect Lid	17	Hold down-CY	
16	BRT3-35x45x3	Ring	17	Hold down-CY	NOK

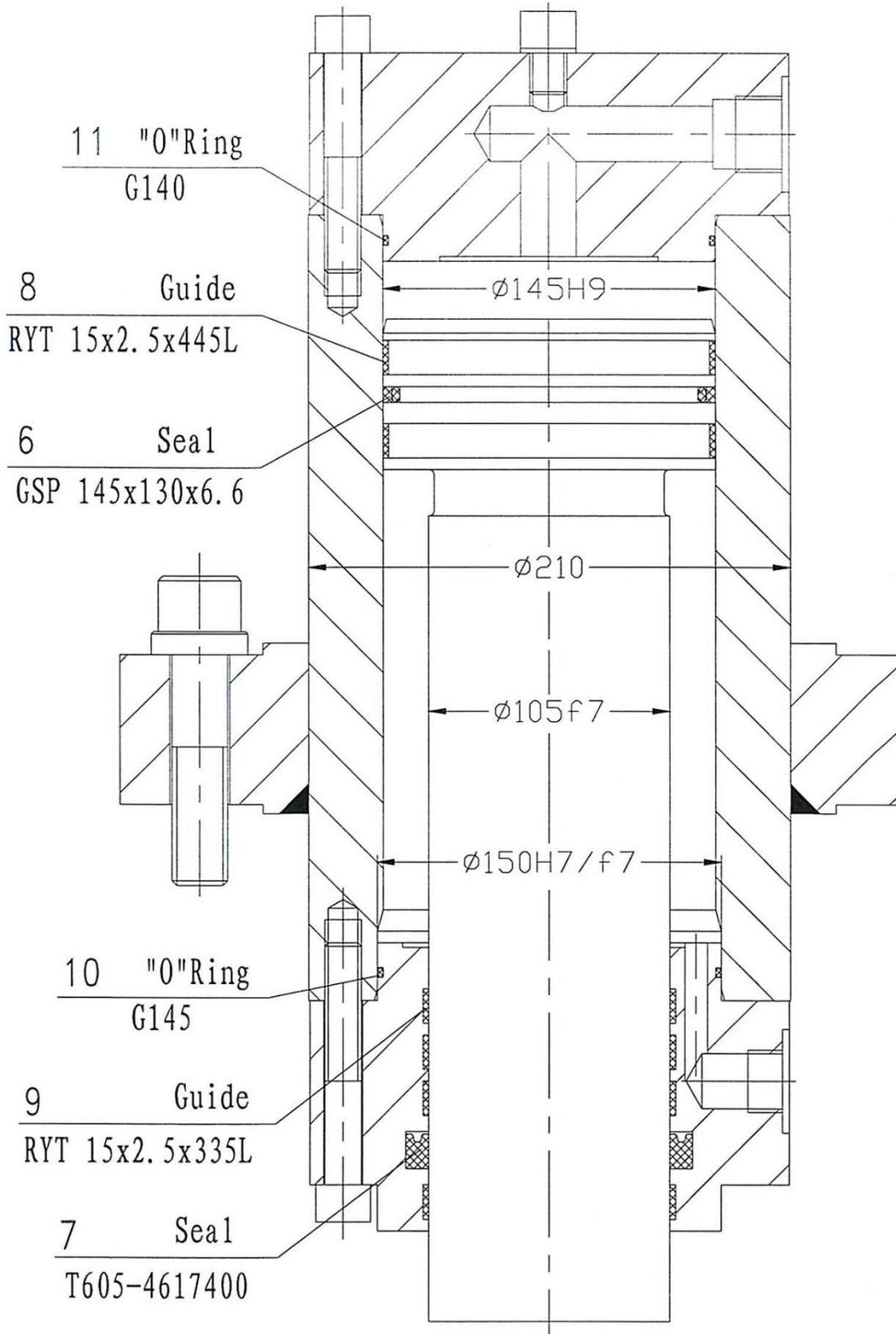


### LEFT HYDRAULIC CYLINDER DIAGRAM





### RIGHT HYDRAULIC CYLINDER DIAGRAM





### CLAMPING HYDRAULIC CYLINDER DIAGRAM

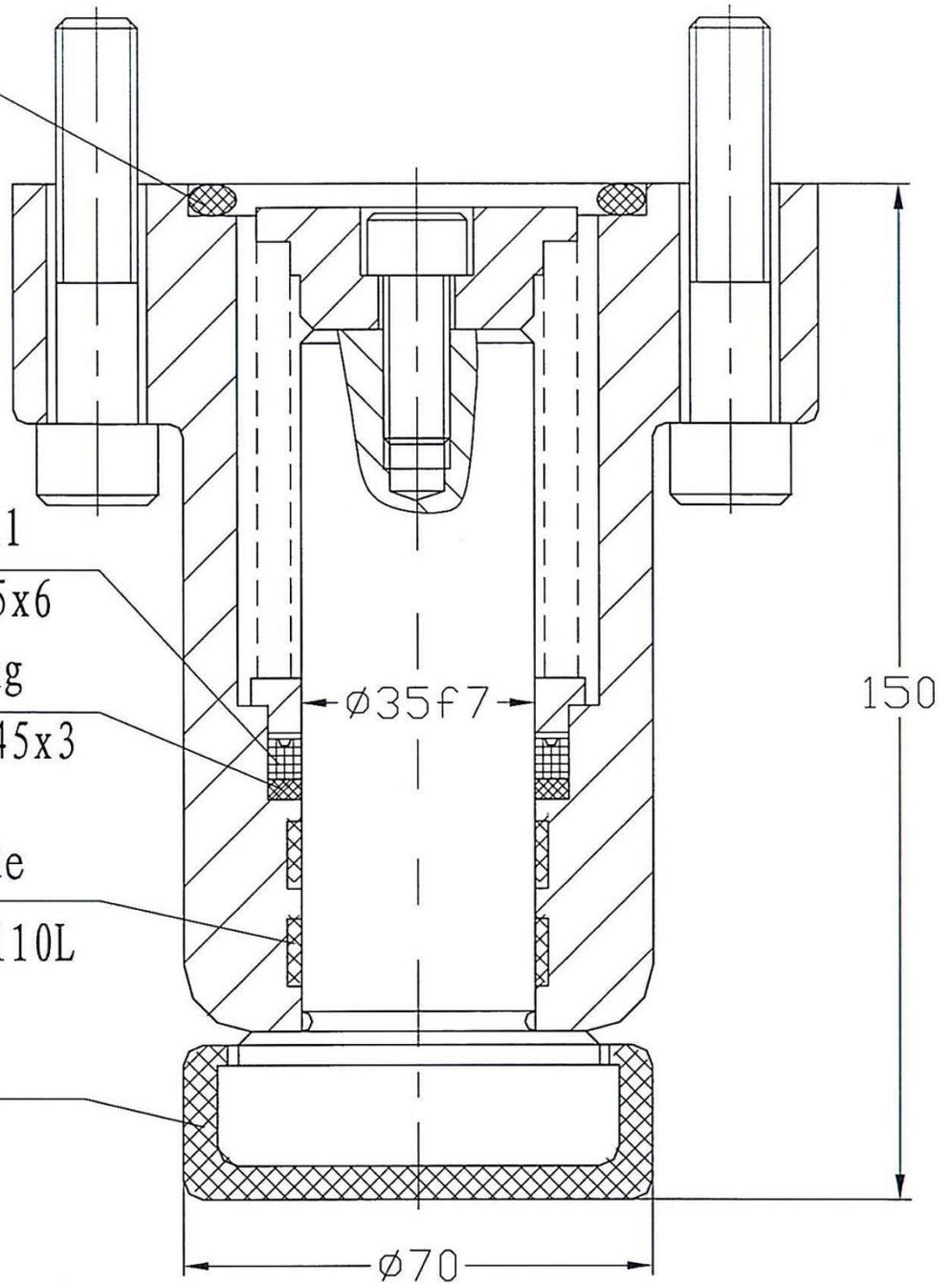
12 "O"Ring  
G58

13 Seal  
USH 35x45x6

16 Ring  
BRT2-35x45x3

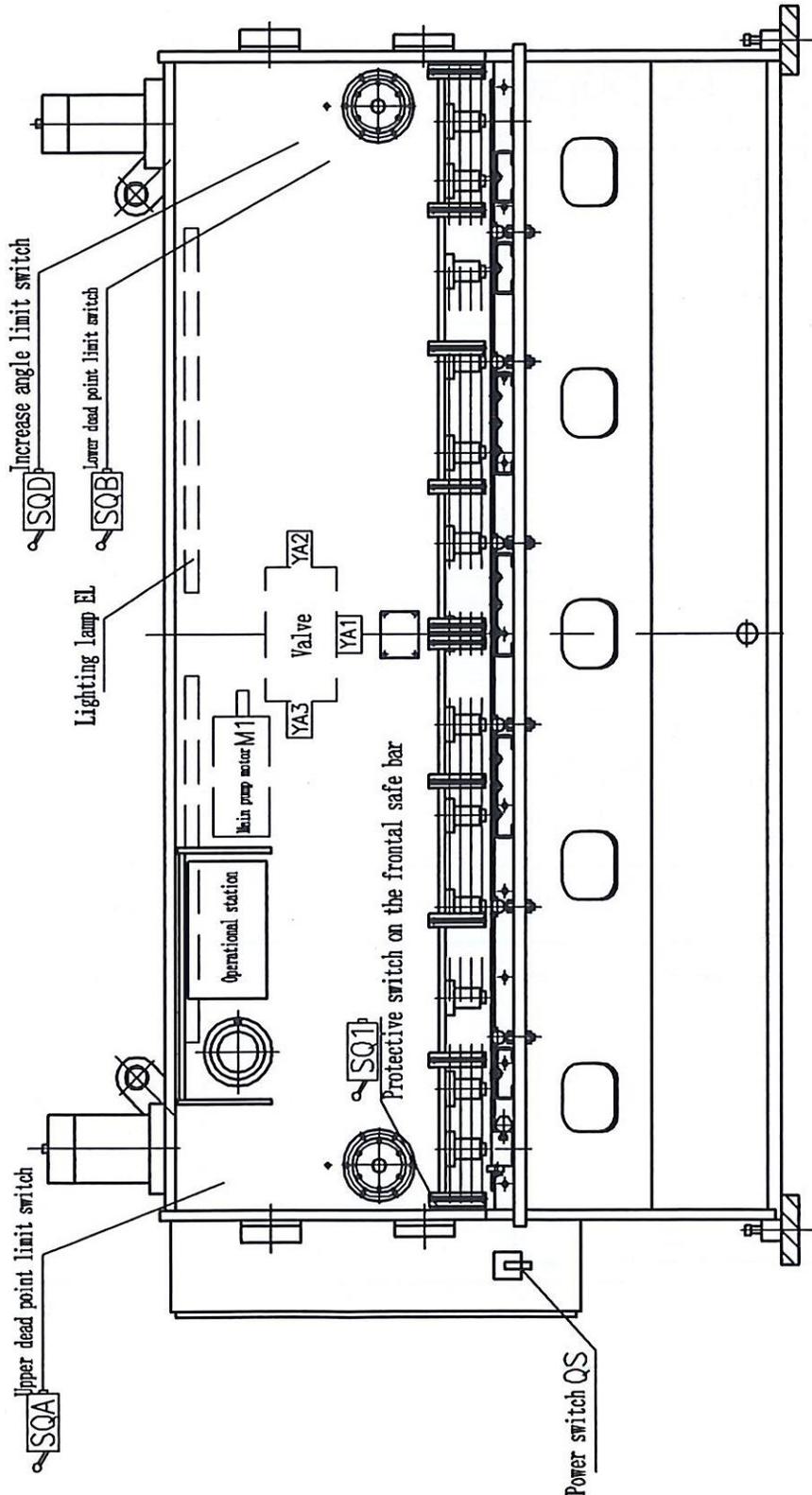
14 Guide  
RYT 10x2.0x110L

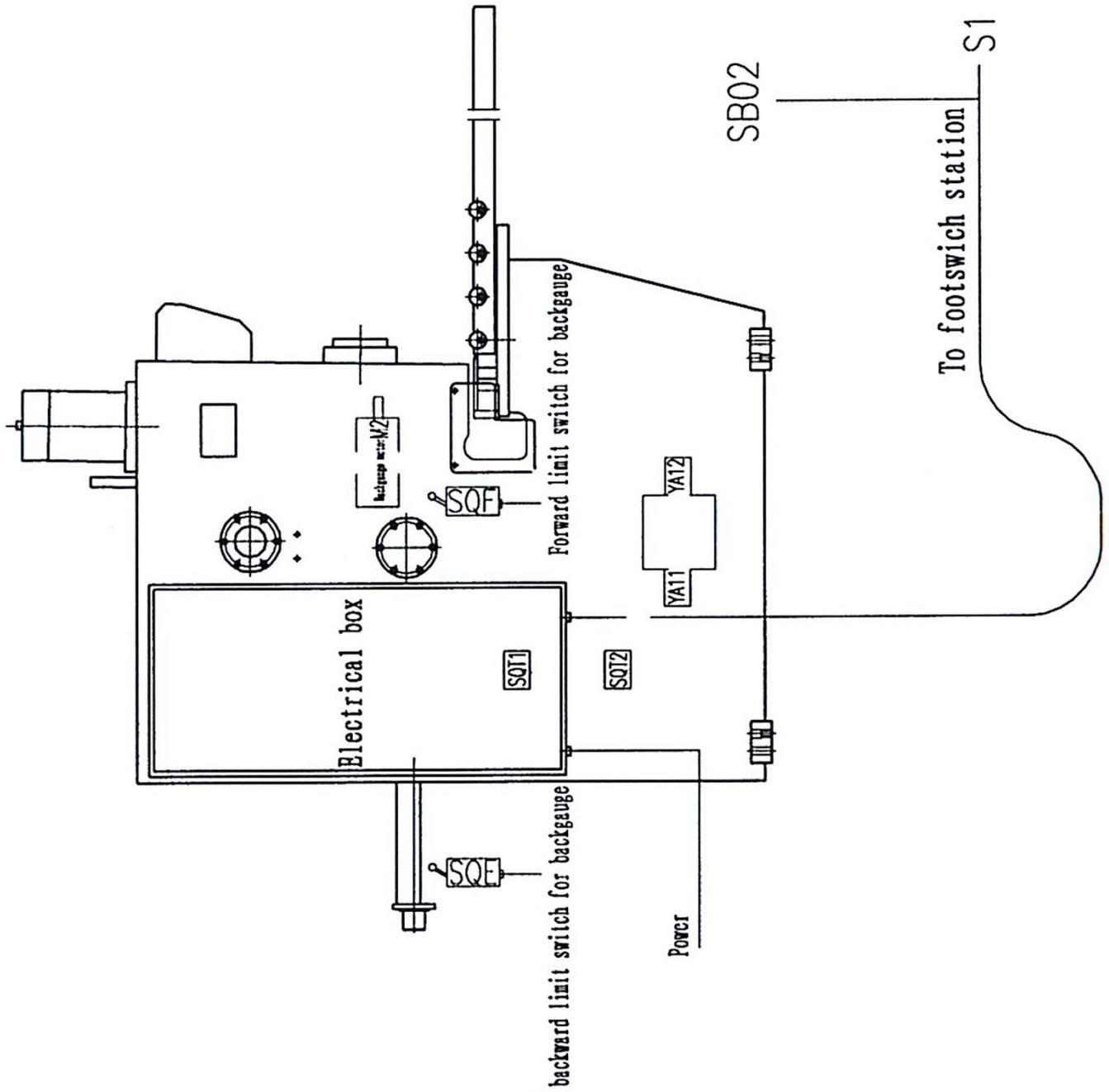
15  
70x23





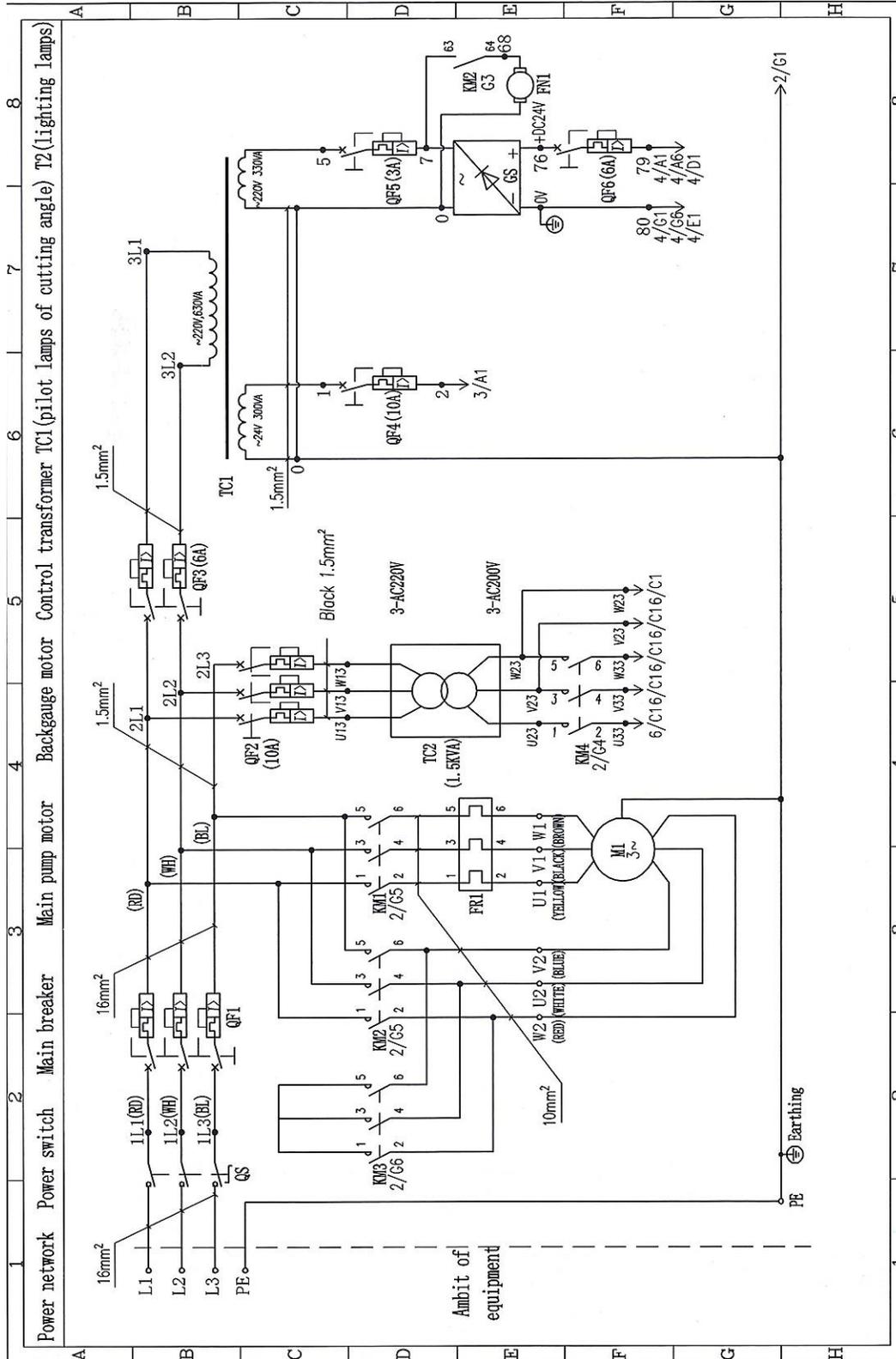
## ELECTRICAL COMPONENT LOCATIONS

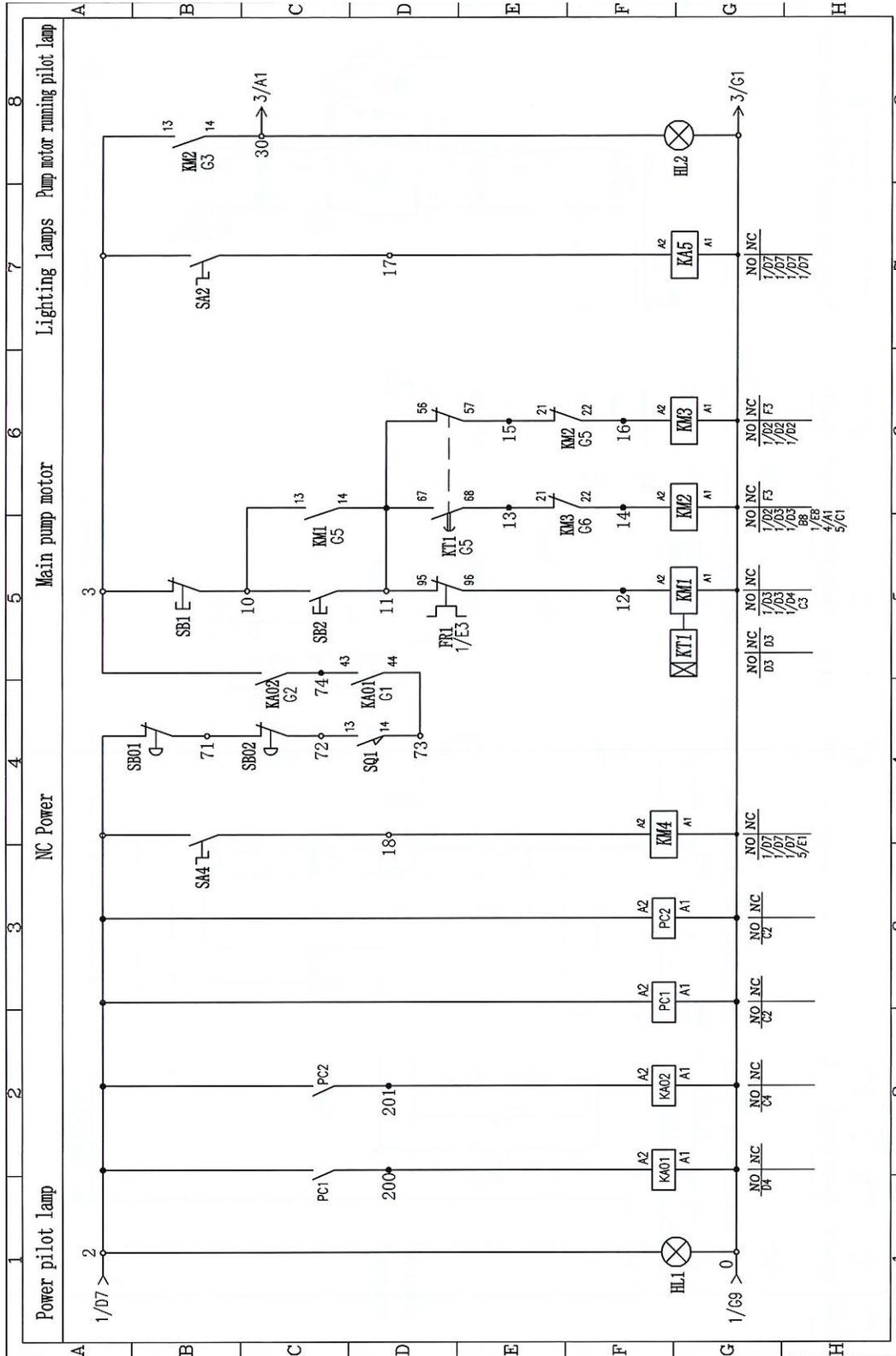




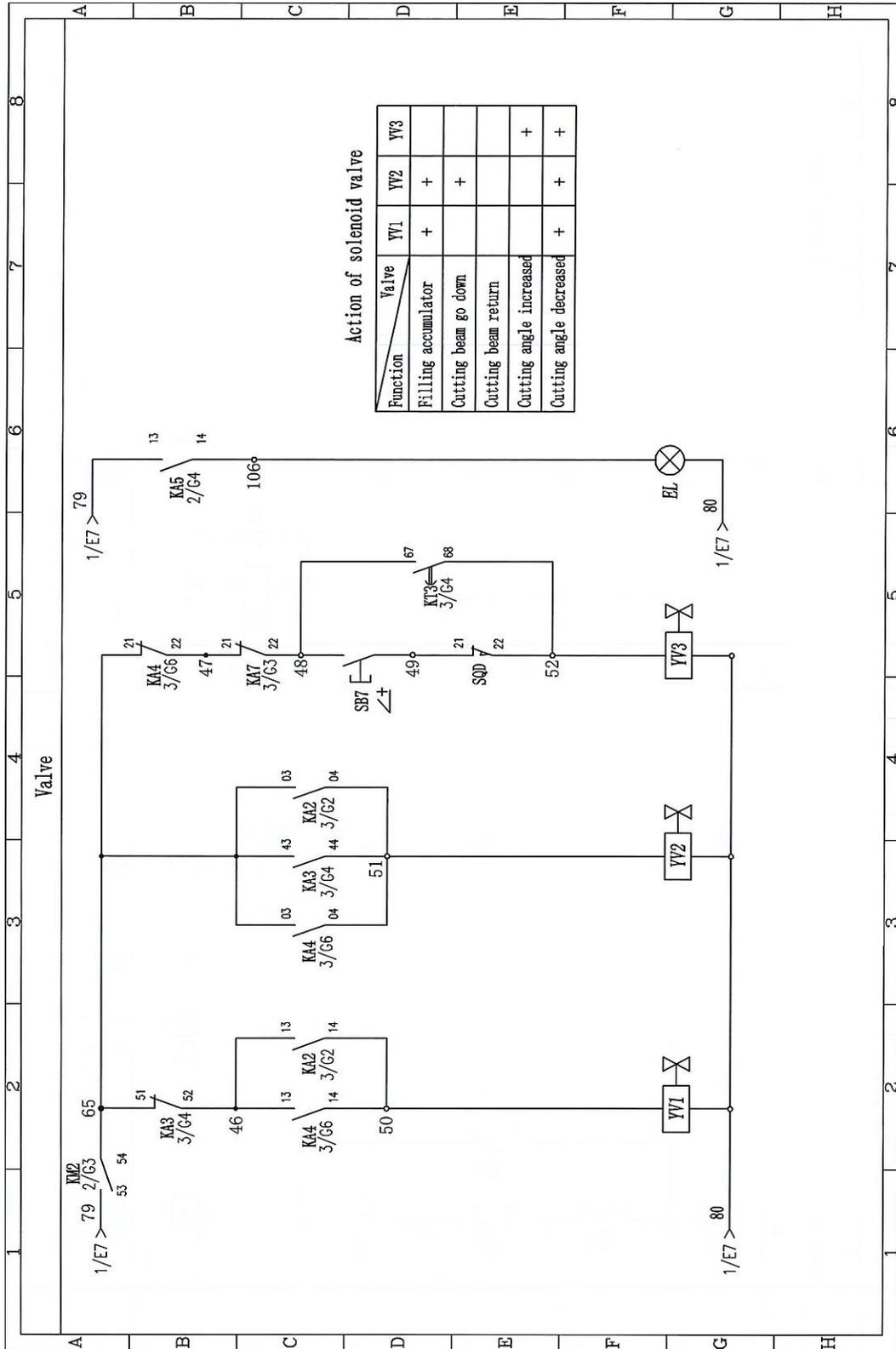


# ELECTRICAL SCHEMATIC

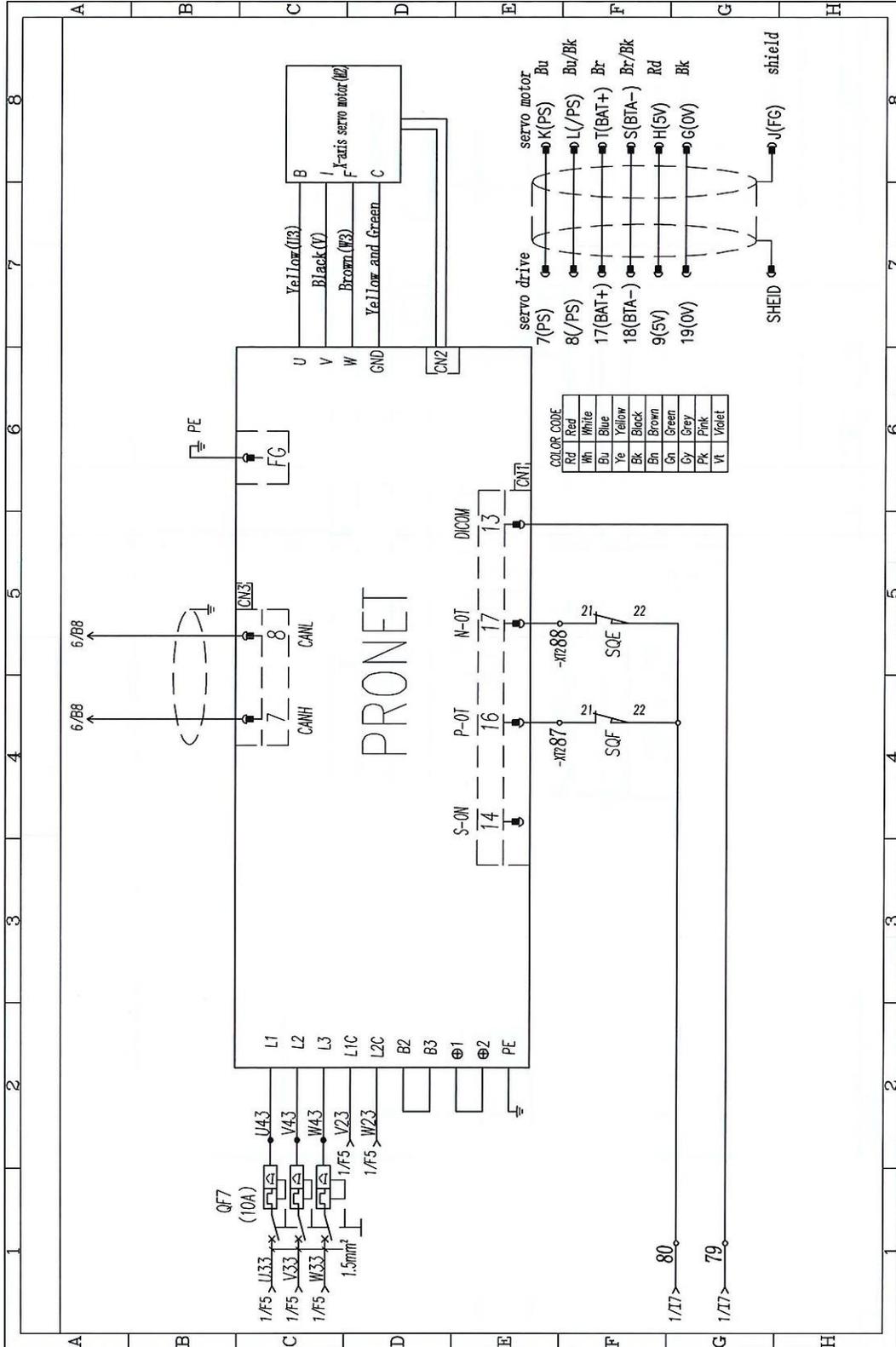






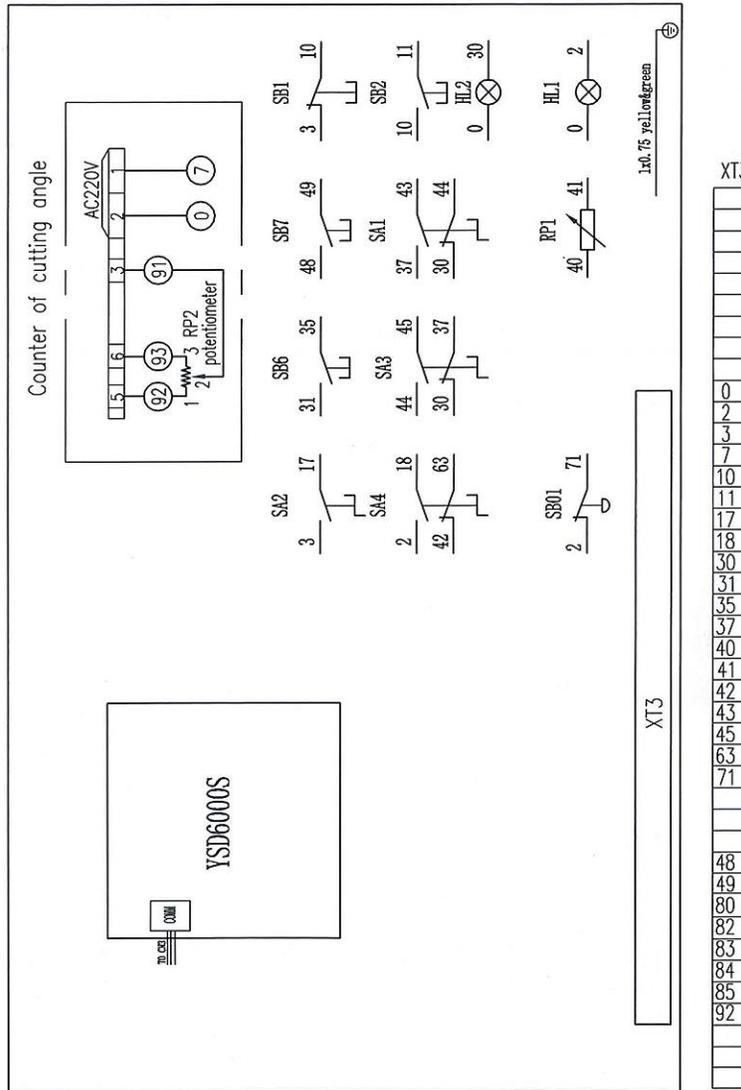




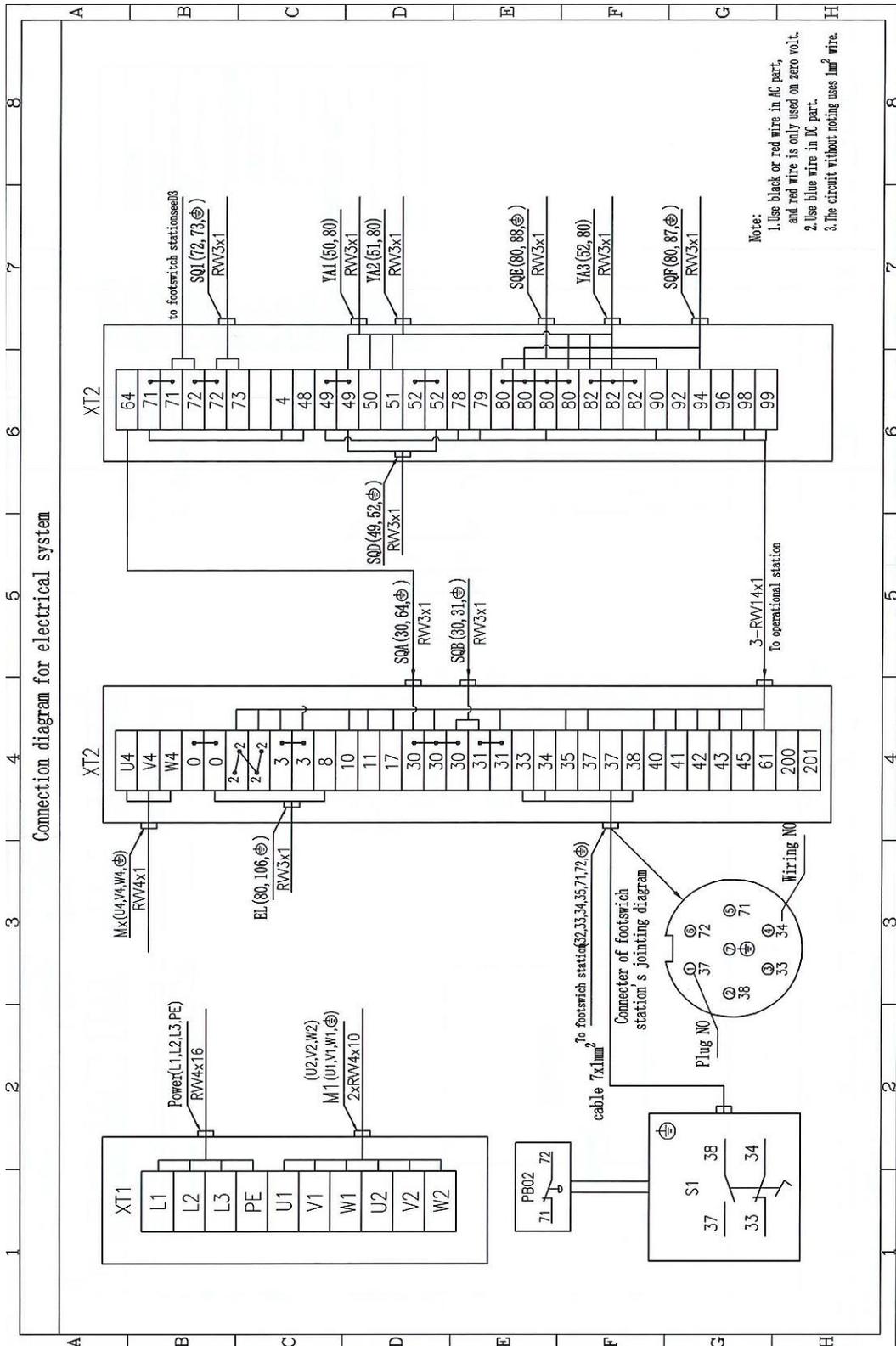


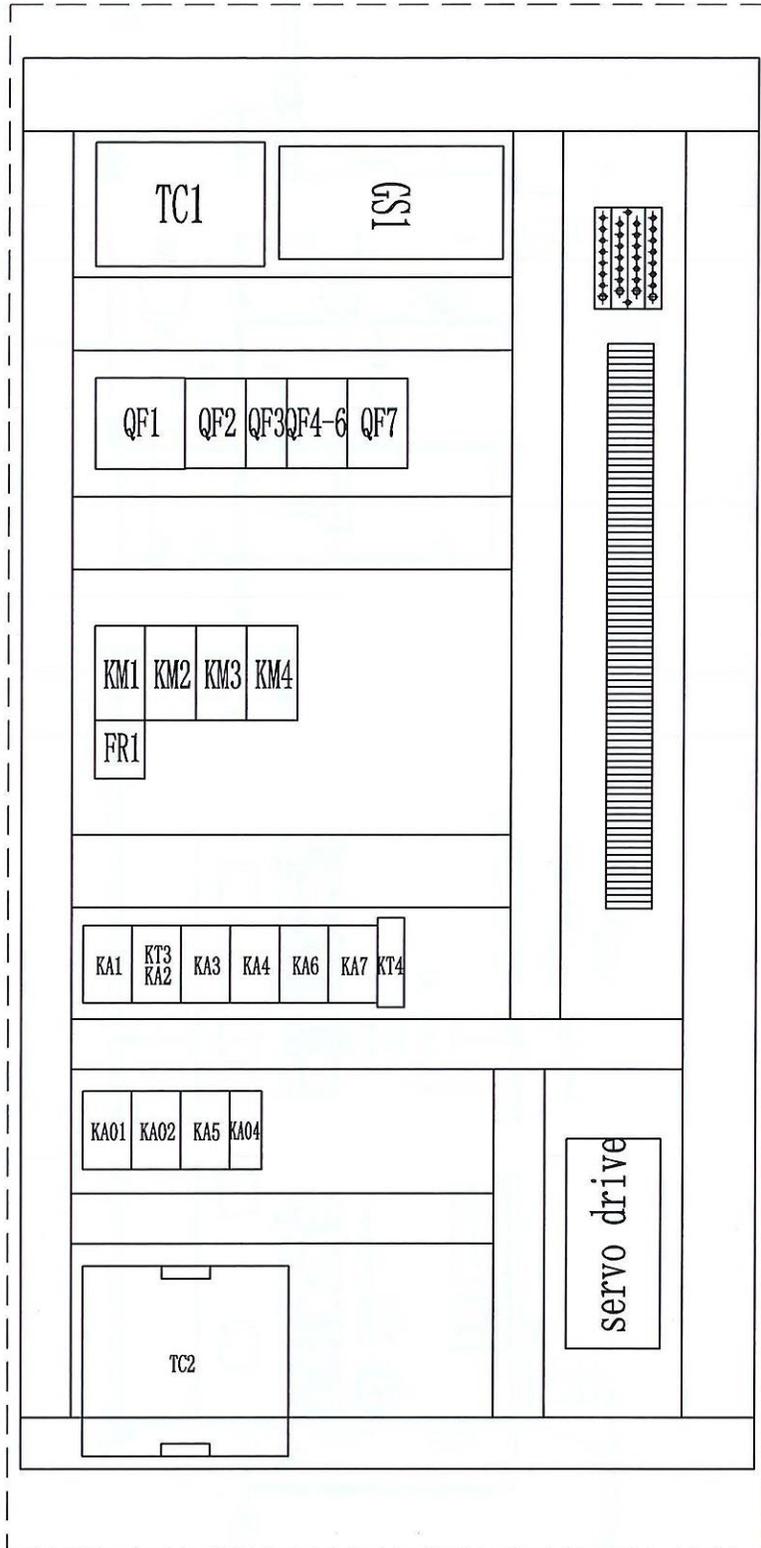


Wiring diagram



HL1	Power pilot lamp
SB1	Stop pump motor
SB2	Run pump motor
HL2	Pump motor running pilot lamp
SB6	Minish cutting angle
SB7	Augment cutting angle
HL1-5	Pilot lights of cutting angle
SA1	Operating mode (Foot-action/Once-action)
SA2	Lighting lamps
SA3	Charge of accumulator
SA4	Numerical control system
RP1	Potentiometer of cutting
SB01	Emergency stop







## Electrical Components List

Code	Type	Name	Specifications	Qty.
QS	V3	Power Switch	63A	1
QF1	GG45-D63-3P	Circuit Breaker	63A, 3P	1
KM1, 2	LC1-D32B7C	AC Contactor	AC24V, 50-60Hz	2
KT1	LAD-T2	Time Delay	0-30s	1
	LAD-N20C	Auxiliary Contact		1
KM3	LC1-D18B7C	AC Contactor	AC24V, 50-60Hz	1
KM4	LC1-D09B7C	AC Contactor	AC24V, 50-60Hz	1
FR1	LRD-32C	Thermo-Relay		1
	SAK16	Terminal Block		9
	EK16	Terminal Block		1
TC1	JBK5-630	Transformer		1
QF3	GG45-D6-2P	Circuit Breaker	6A, 2P	1
QF4	GG45-D10-1P	Circuit Breaker	10A, 1P	1
QF5	GG45-D3-1P	Circuit Breaker	3A, 1P	1
QF6	GG45-D6-1P	Circuit Breaker	6A, 1P	1
QF2, 7	GG45-D10-3P	Circuit Breaker	10A, 3P	2
	S-150-24	DC Power		1
	CAD-N32B7C	Relay	AC24V, 50-60Hz	7
KA1, 5	CAD-N50B7	Relay	AC24V, 50-60Hz	2
KT4	RE22R2AMR	Time Delay	AC24V, 50-60Hz	1
KA3	LAD-N02C	Auxiliary Contact		1
KT3	LAD-T0	Time Delay	0-3s	1
	DRM570024LT	Relay		1
S1	MD-14H	Foot Switch		1
	C408	Door Lock		2
	PLT-307-RF+PM	Connector		1
	BNL-6	End Section		8
	SAK2.5	Terminal Block		60
	TT10-24	Terminal Block		2
	TC6545S	Wiring Trough		1m
	TC4545S	Wiring Trough		4m
	PGH-1	No. Pipe		200
	V-5.5	Color Pipe		15



	RV30YN20SB203	Potentiometer		1
	XB2-BVB1C	Power Pilot Lamp		1
	ZB2-BS54C	Push Button		1
	ZB2-BZ102C	Push Button		1
	XB5-AA42C	Push Button		1
	ZB2-BW33C	Push Button		1
	ZB2-BWB31C	Push Button		1
	XB5-AA21C	Push Button		2
	ZB2-BG2C	Push Button		3
	ZB2-BZ101C	Push Button		4
	ZB2-BD2C	Push Button		1
	ZB2-BE102C	Push Button		2
	YSD6000S	Numerical Control System		1
	PAXD	Counter		1
	OS80-RPVR5Q1	Photoelectric Switch		2
	XCK-M115	Limit Switch		5
	XCKN2145P20C	Limit Switch		1
	EMG-10ASB22	Servo Motor		1
	Pronet-10AMA	Servo Driver		1
	SG-1.5-220V-240V-200V	3P Transformer	3-220V, 1.5kVA Out 3-200V, 1.5kVA	1



NOTES



NOTES



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