



# OPERATOR'S MANUAL

Metal Working



## HYDRAULIC SHEAR MODEL: SH-120250-HD

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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.



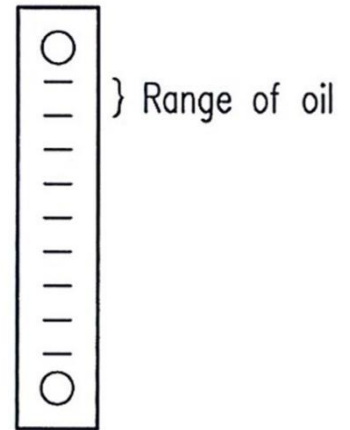
**Important:** *Used oil products must be disposed of in a proper manner following your local regulations.*

1. Remove the center (and right if desired) front cover to access the reservoir.
2. Have a container capable of holding at least 30 gal. (114L) 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.





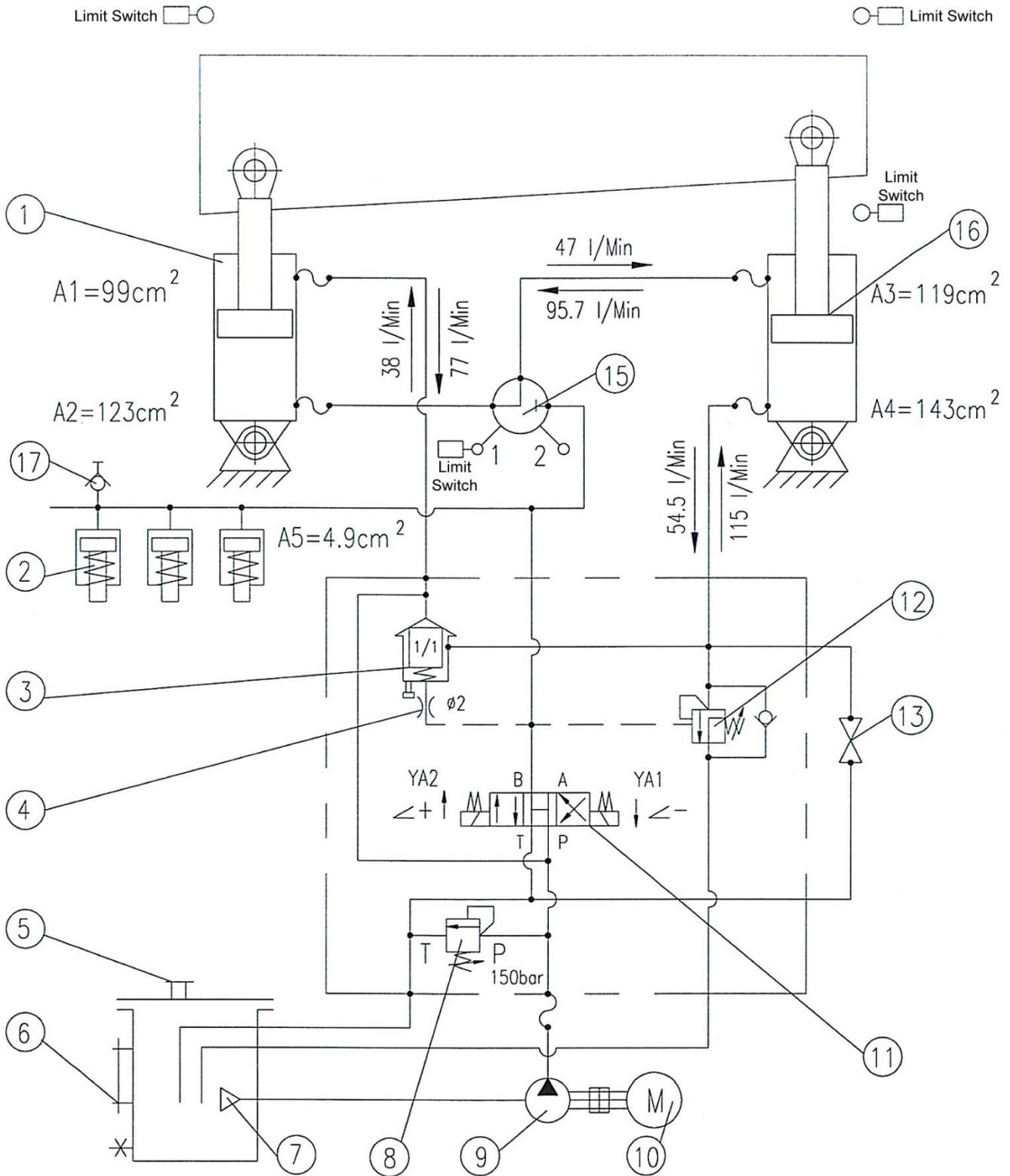
4. Remove the top cover and clean the hydraulic tank and re-install the top cover.
5. Use hydraulic oil #68 SHELL BRAND or an equivalent with similar specifications to fill the hydraulic tank until it reaches the midpoint on the sight gauge.
6. Keep hydraulic reservoir filled to 90% of capacity.
7. DO 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 SCHEMATIC





**Hydraulic Parts List**

| Item | Code                    | Name              | Qty. | Remarks |
|------|-------------------------|-------------------|------|---------|
| 1    |                         | Left Cylinder     | 1    |         |
| 2    |                         | Clamping Cylinder | 17   |         |
| 3    |                         | Two Way Valve     | 1    |         |
| 4    |                         | Throttle Valve    | 1    |         |
| 5    | QUQ2-20x1.0             | Air Filter        | 1    |         |
| 6    | TS-5                    | Fluid Level       | 1    |         |
| 7    | WF-12x100               | Oil Filter        | 1    |         |
| 8    | DGMC-5-PT-GW-41         | Pressure Valve    | 1    | VICKERS |
| 9    | DVQ25-22FRAR-02         | Oil Pump          | 1    | KCL     |
| 10   | Y132M-4                 | Motor 7.5kW       | 1    | B35     |
| 11   | 4WE10H73-3X/EG24N9K4A12 | Solenoid Valve    | 1    | REXROTH |
| 12   | SO5A-R3/14              | Balance Valve     | 1    |         |
| 13   | GCT-02                  | Braking Valve     | 1    |         |
| 15   | KH3-G3/4-1112-01X       | Change-over Valve | 1    |         |
| 16   |                         | Right Cylinder    | 1    |         |
| 17   | D1-3/G1/4               | Pressure joint    | 1    |         |



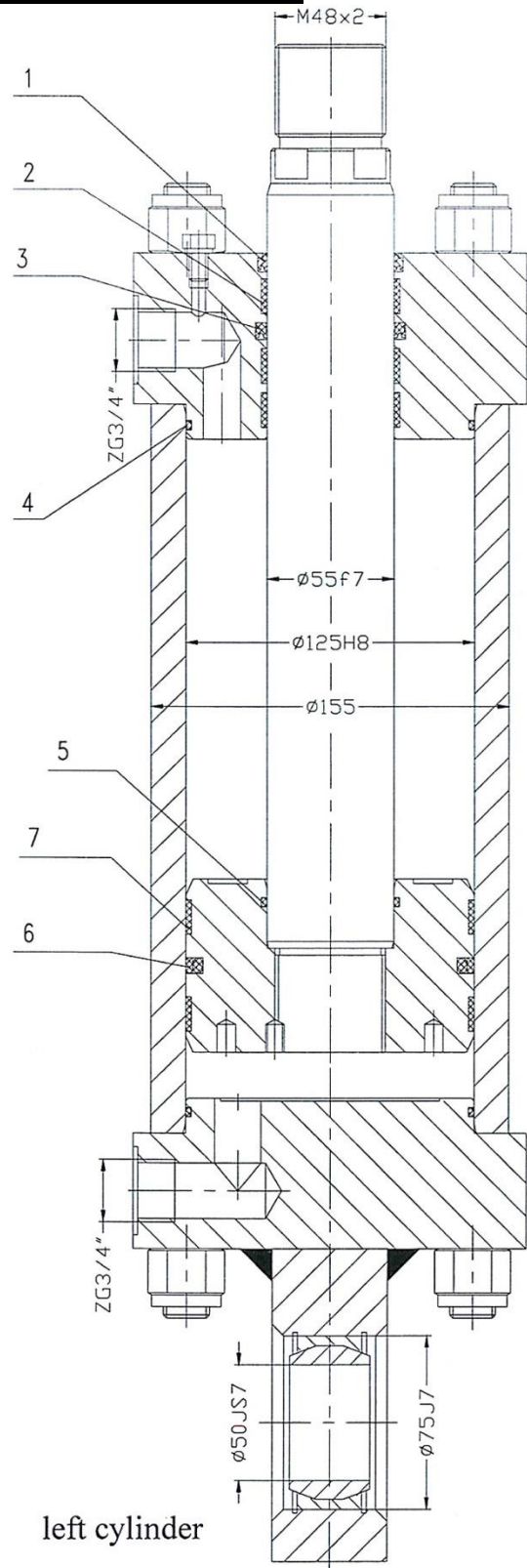
**List of Hydraulic Wear Parts**

| No. | Name           | Specification        | Qty. | Position          | Remarks |
|-----|----------------|----------------------|------|-------------------|---------|
| 1   | Dustproof Seal | DH (LBI) 55x63x5x6.3 | 1    | Left Cylinder     | NOK     |
| 2   | Guide Seal     | RYT15x2.5x173        | 3    | Left Cylinder     | NOK     |
| 3   | Rod Seal       | T605-4615600         | 1    | Left Cylinder     | HALLITE |
| 4   | "O"-Ring       | G120                 | 2    | Left Cylinder     |         |
| 5   | "O"-Ring       | G55                  | 1    | Left Cylinder     |         |
| 6   | Piston Seal    | GSP 125x110x6.6      | 1    | Left Cylinder     | REDUX   |
| 7   | Guide Seal     | RYT 15x2.5x393       | 2    | Left Cylinder     | NOK     |
| 8   | Dustproof Seal | DH (LBI) 55x63x5x6.3 | 1    | Right Cylinder    | NOK     |
| 9   | Guide Seal     | RYT 15x2.5x173       | 3    | Right Cylinder    | NOK     |
| 10  | Rod Seal       | T605-4615600         | 1    | Right Cylinder    | HALLITE |
| 11  | "O"-Ring       | G130                 | 2    | Right Cylinder    |         |
| 12  | "O"-Ring       | G55                  | 1    | Right Cylinder    |         |
| 13  | Guide Seal     | RYT 15x2.5x424       | 2    | Right Cylinder    | NOK     |
| 14  | Piston Seal    | GSP 135x120x6.6      | 1    | Right Cylinder    | REDUX   |
| 15  | "O"-Ring       | P40                  | 17   | Clamping Cylinder |         |
| 16  | Rod Seal       | USH 25x33x5          | 17   | Clamping Cylinder | NOK     |
| 17  | Guide Seal     | RYT 8x2x78           | 34   | Clamping Cylinder | NOK     |
| 18  | Ring           | BRT 3-25x33x2        | 17   | Clamping Cylinder | NOK     |



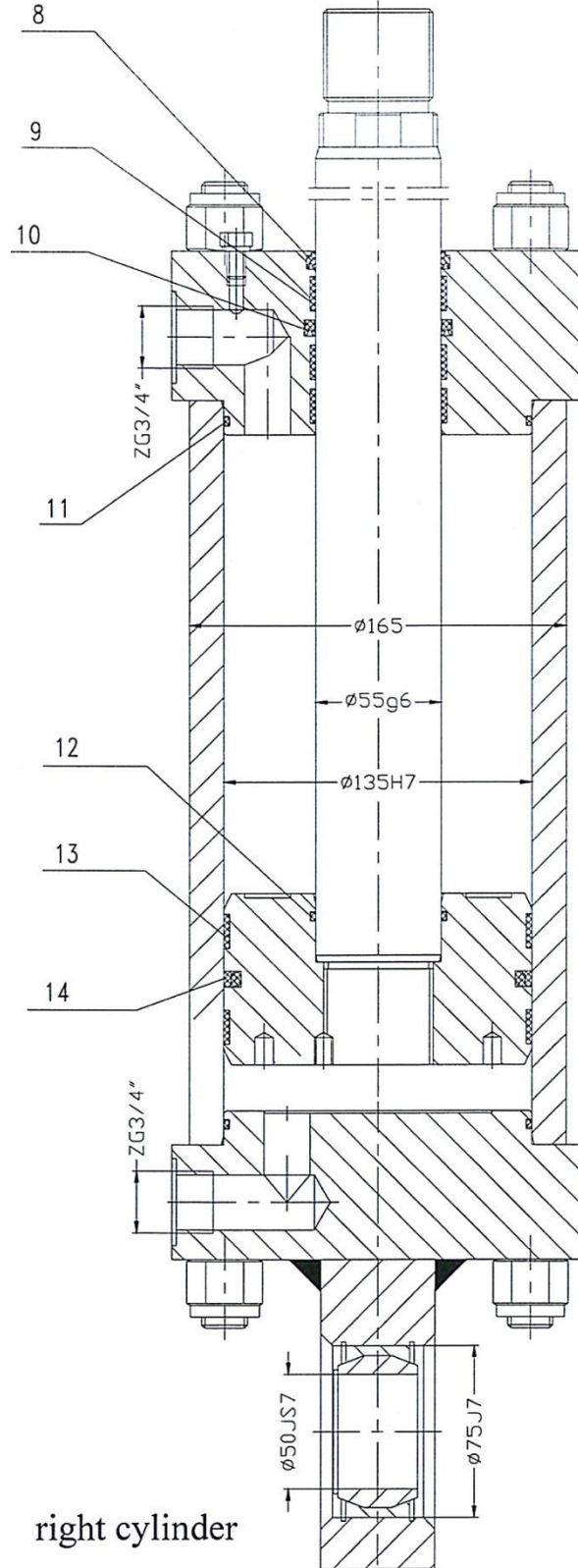


# LEFT HYDRAULIC CYLINDER DIAGRAM





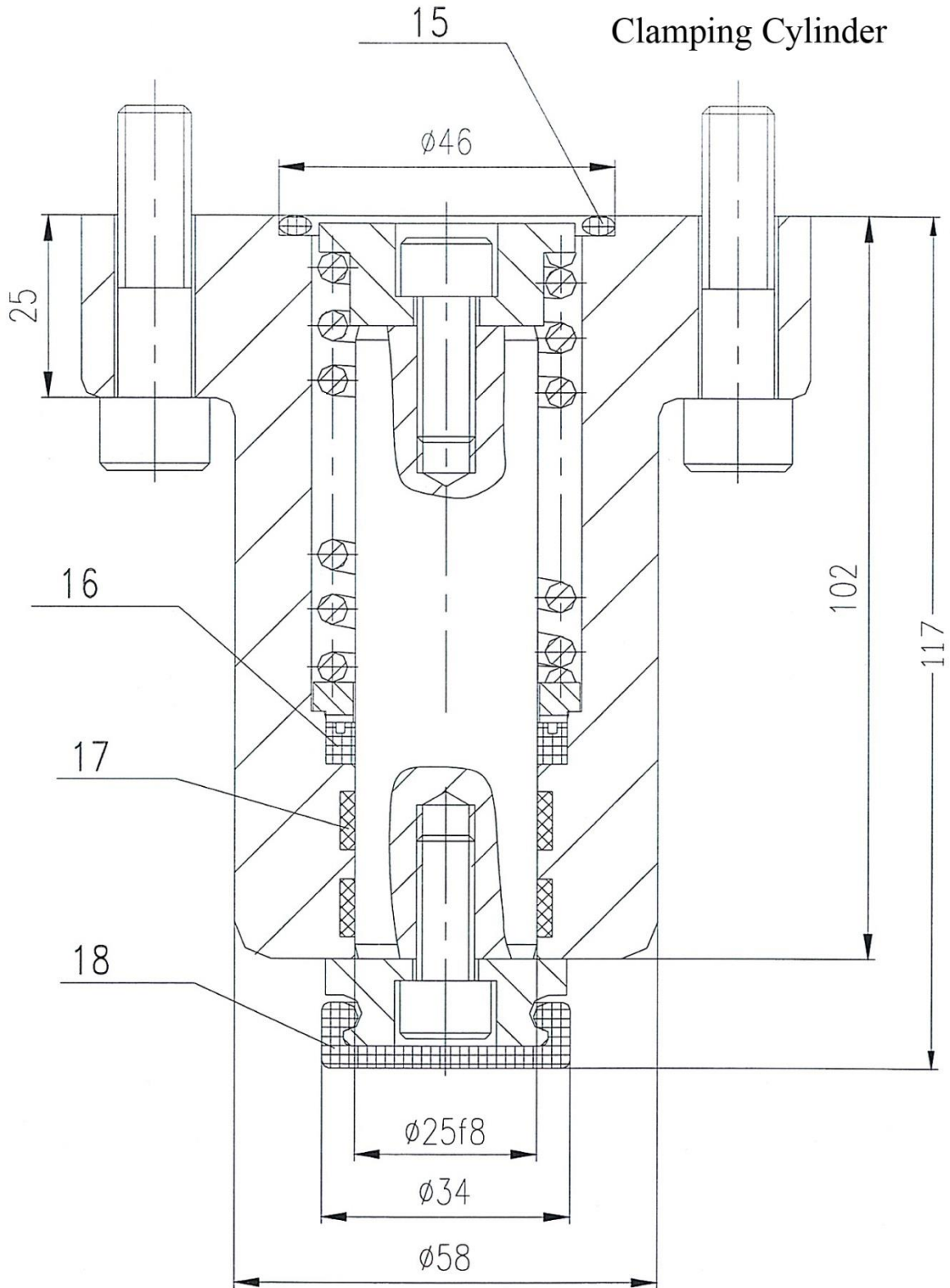
# RIGHT HYDRAULIC CYLINDER DIAGRAM



right cylinder

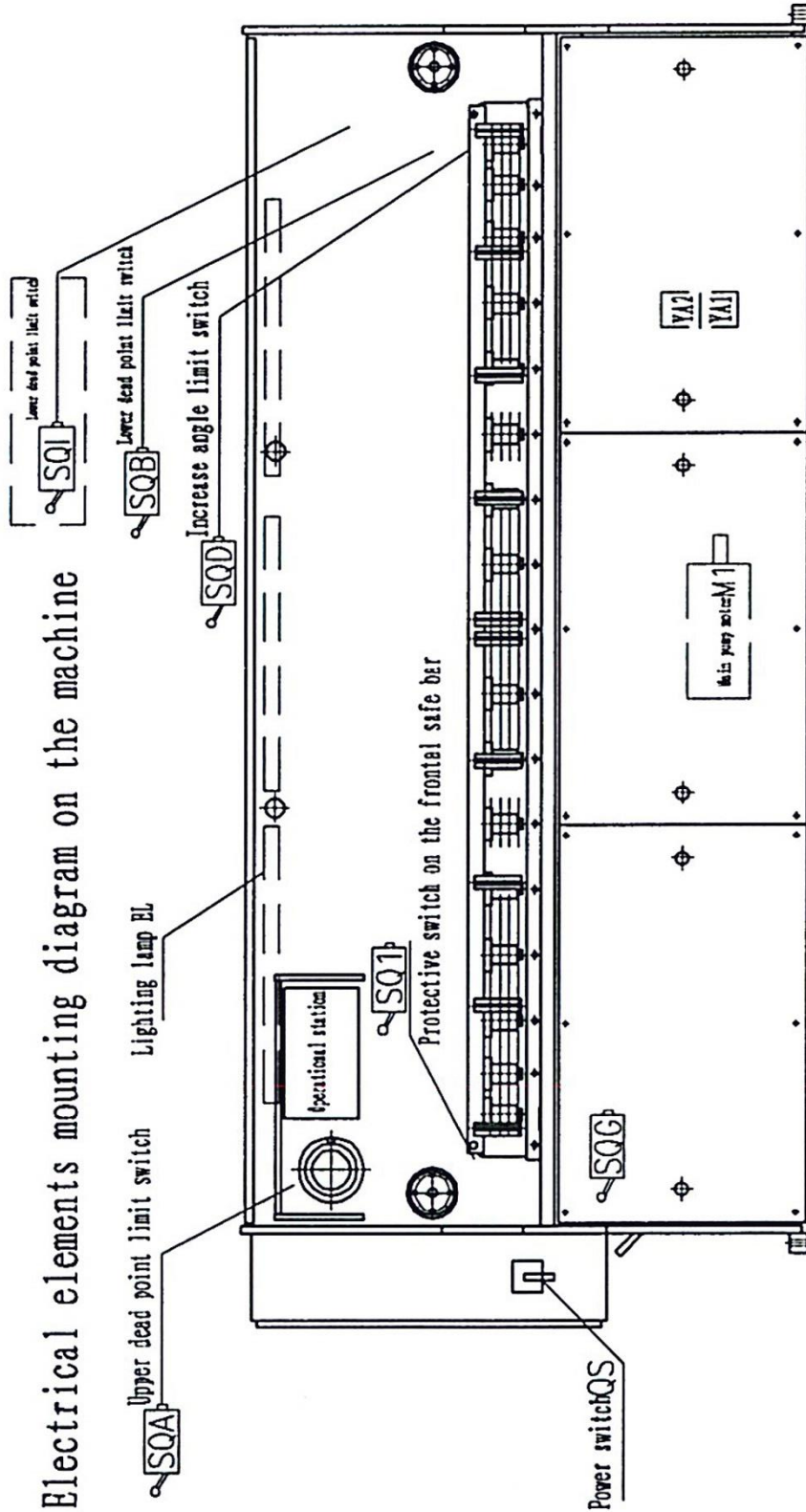


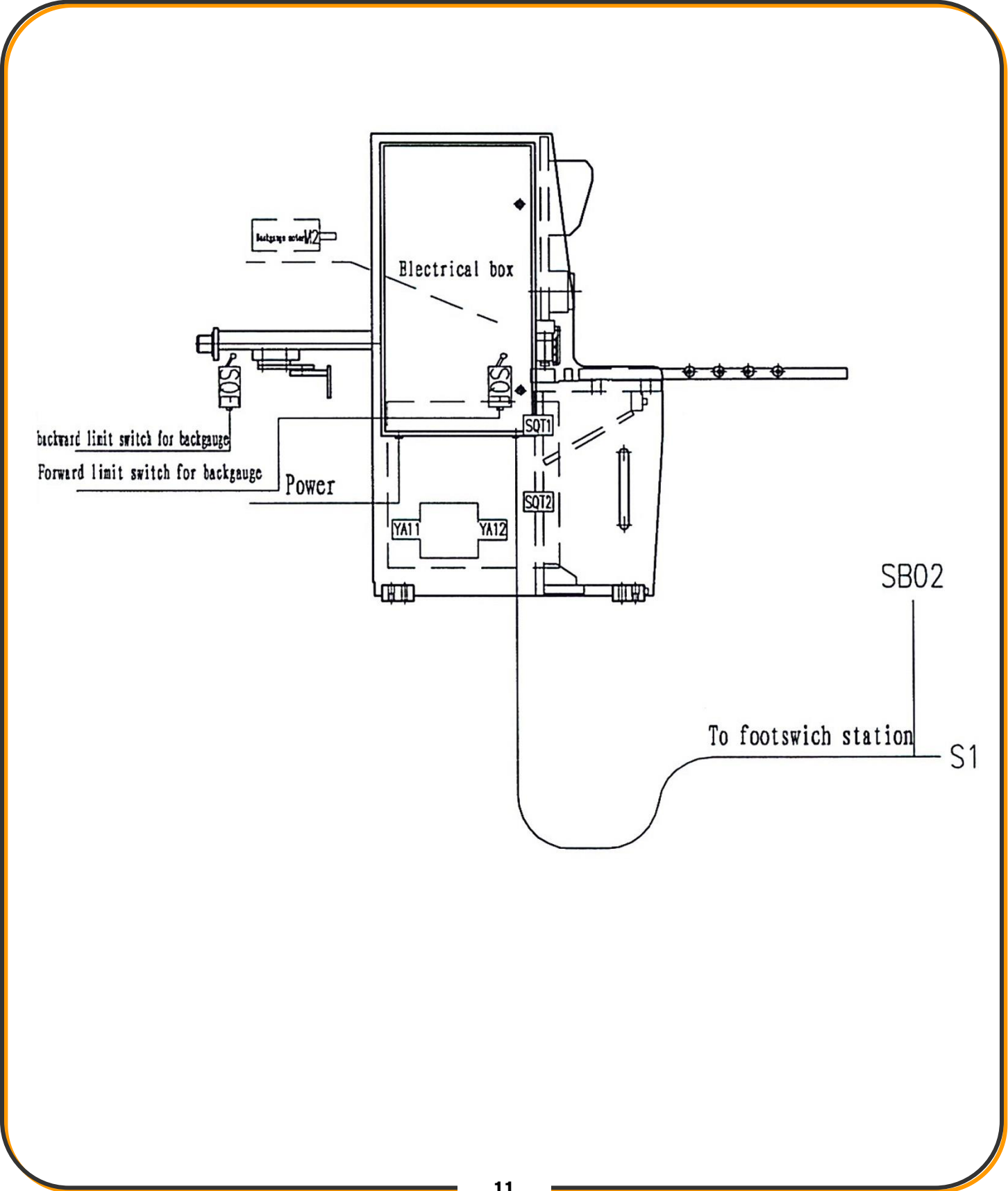
**CLAMPING HYDRAULIC CYLINDER DIAGRAM**





## ELECTRICAL COMPONENT LOCATIONS





backward limit switch for backgauge

Forward limit switch for backgauge

Power

Electrical box

backgauge motor

SOE

HDS

SOT1

SOT2

YA11

YA12

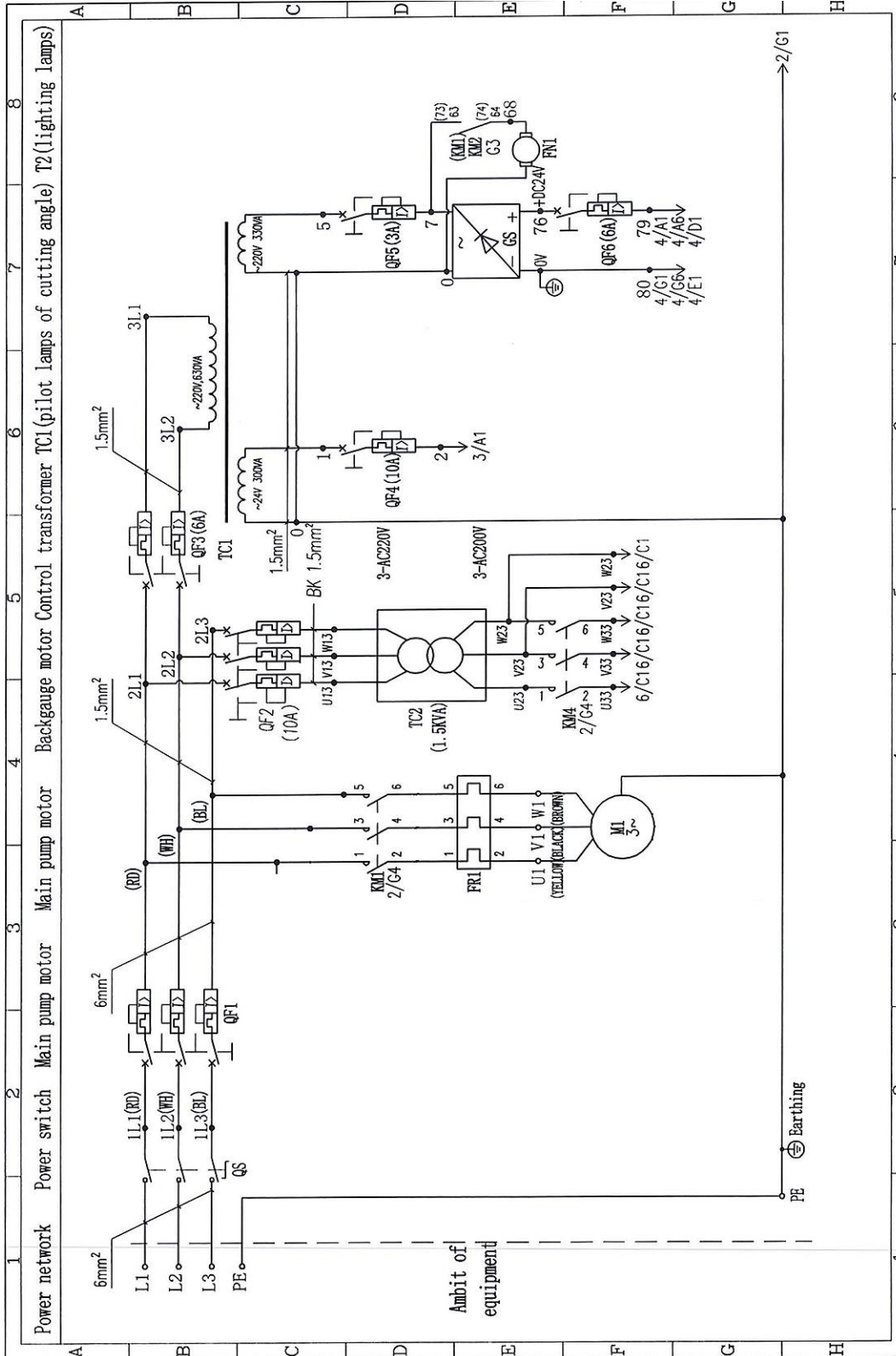
SB02

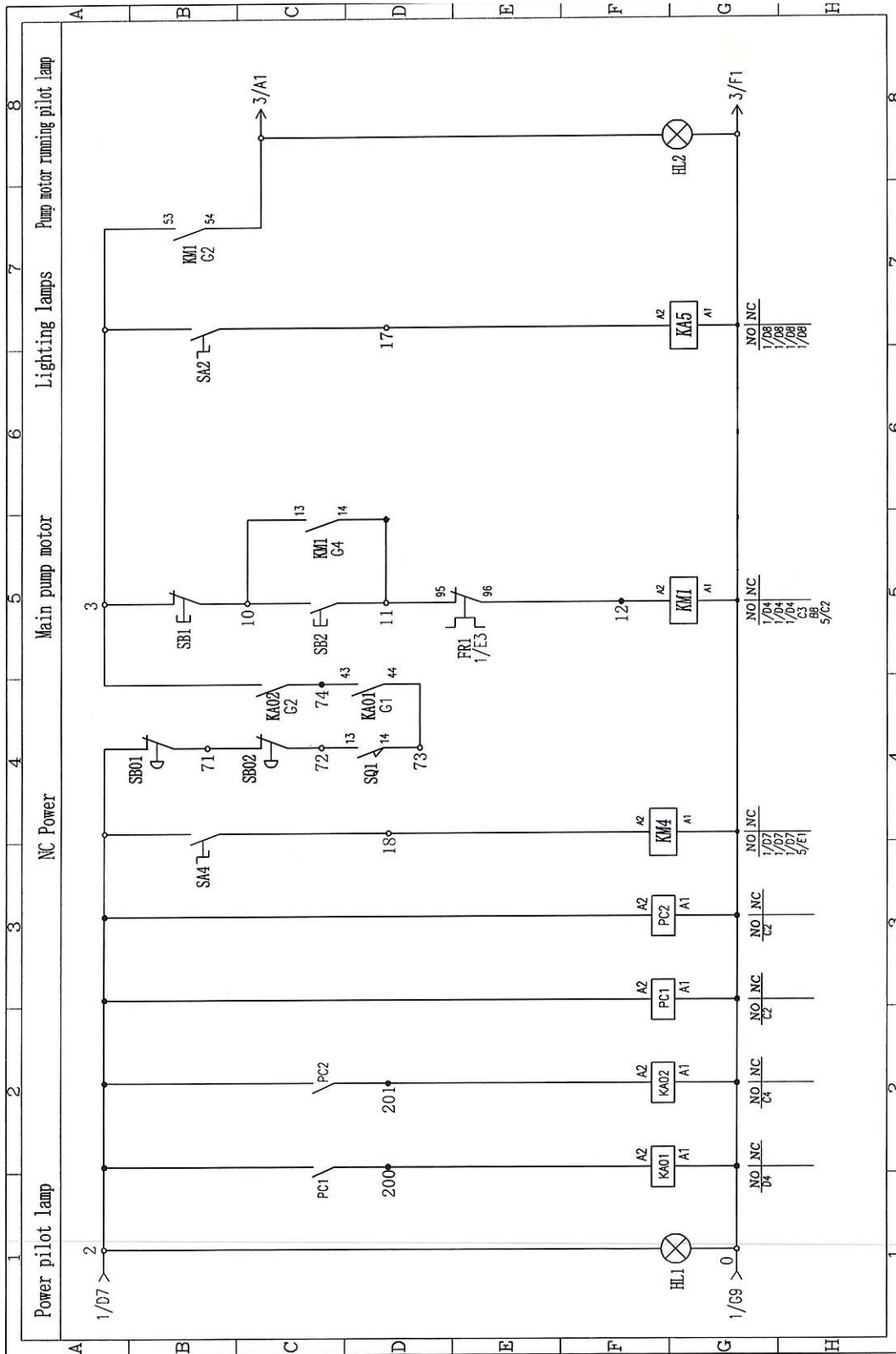
To footswitch station

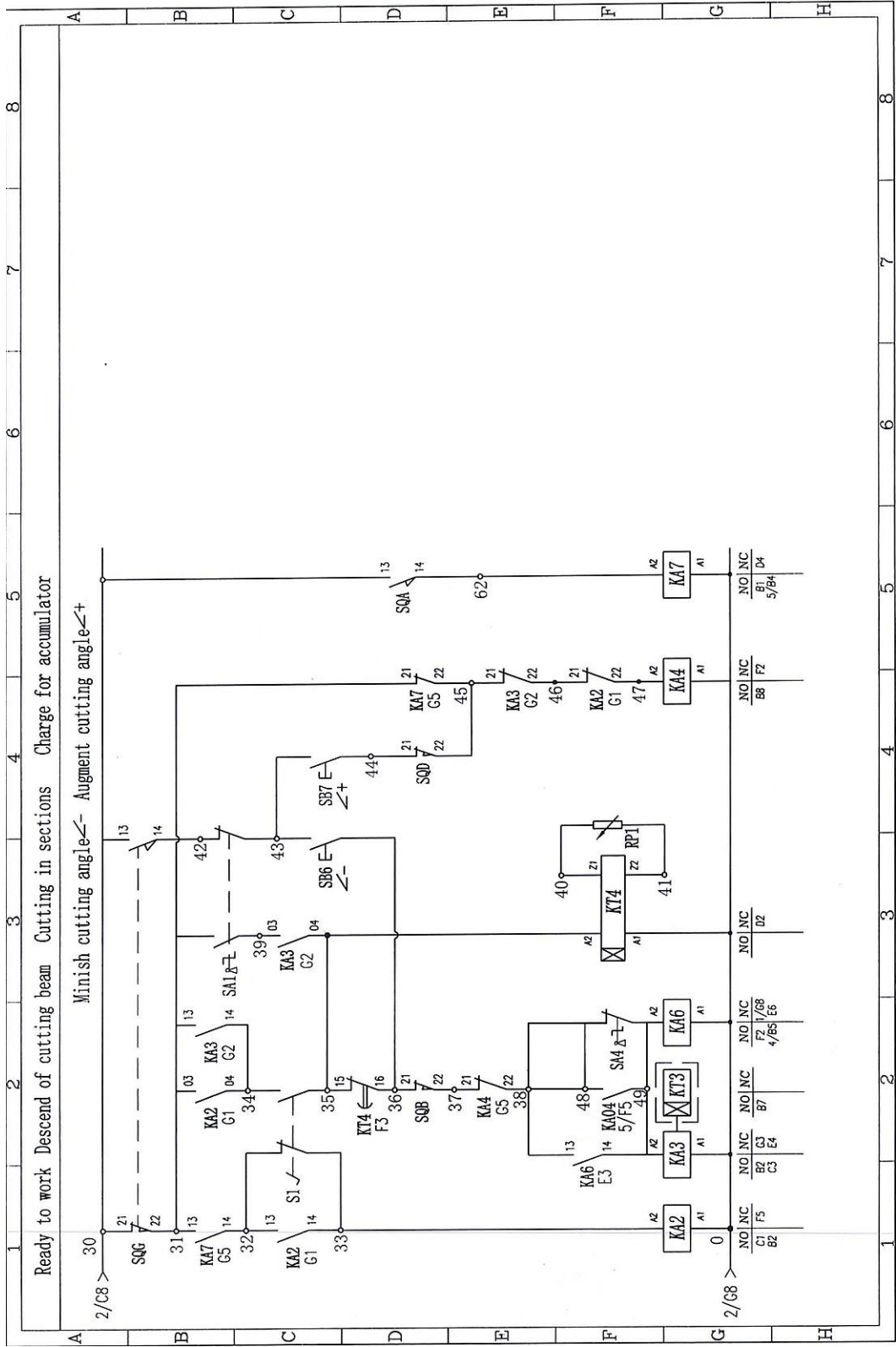
S1



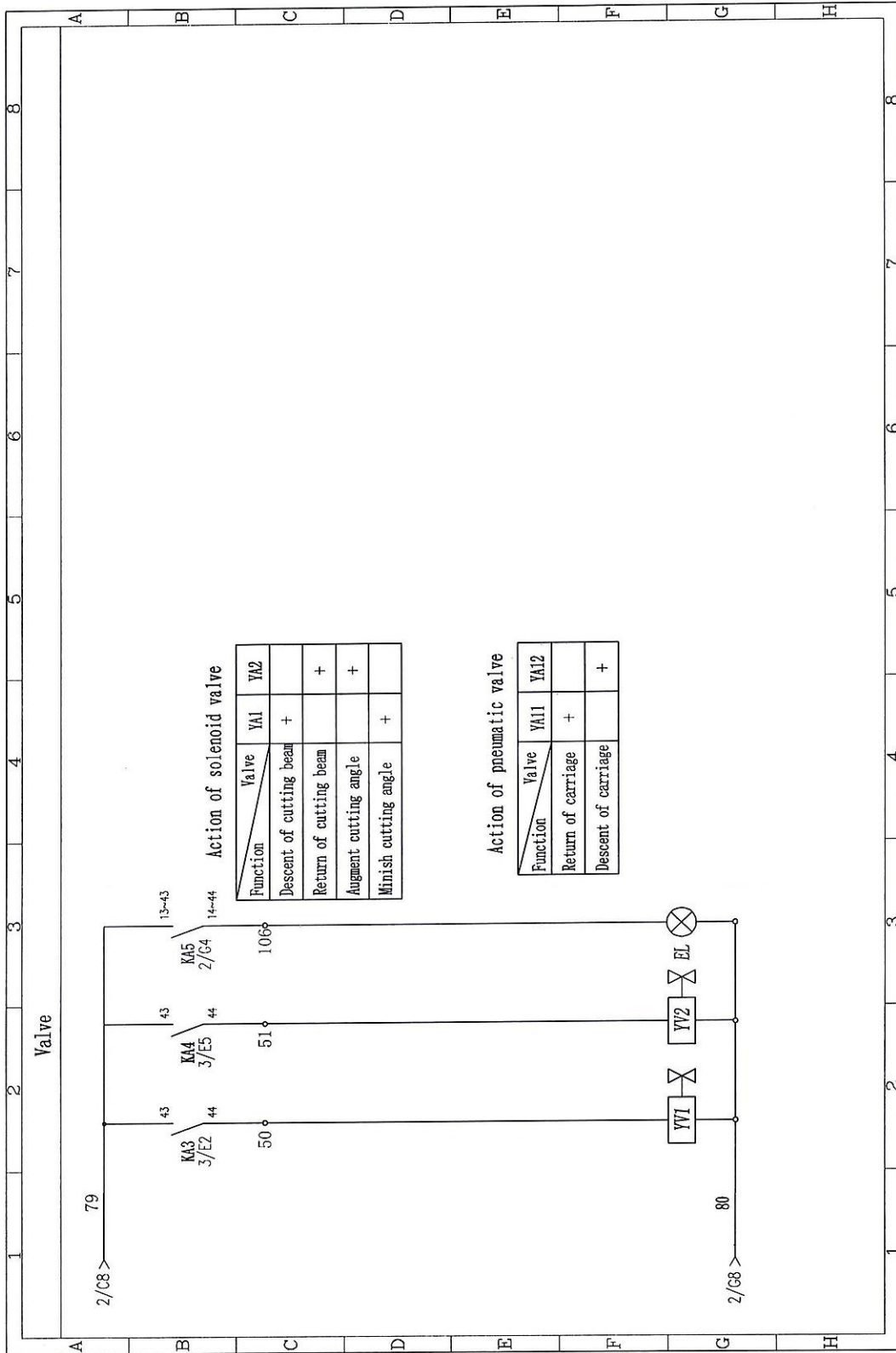
# ELECTRICAL SCHEMATIC









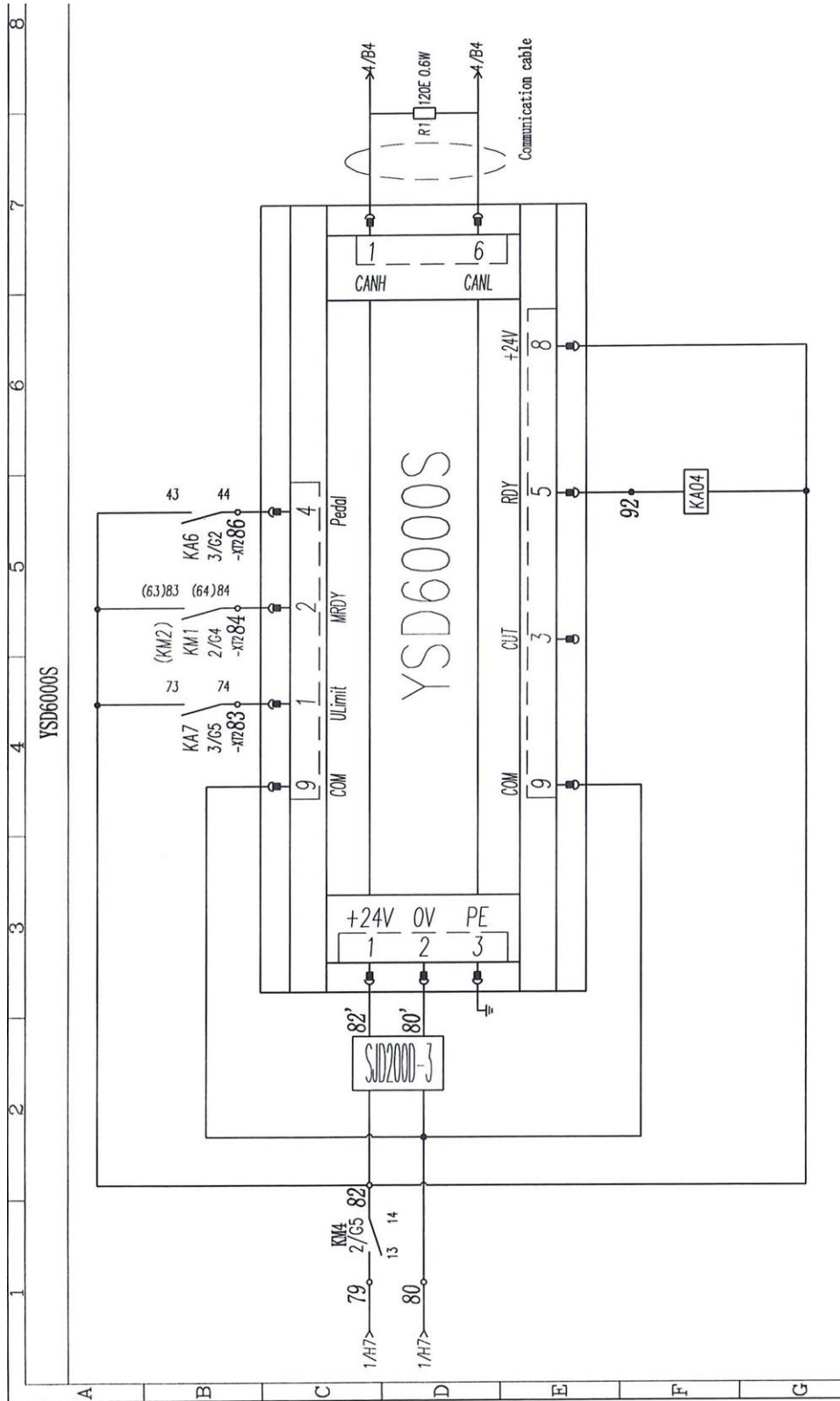


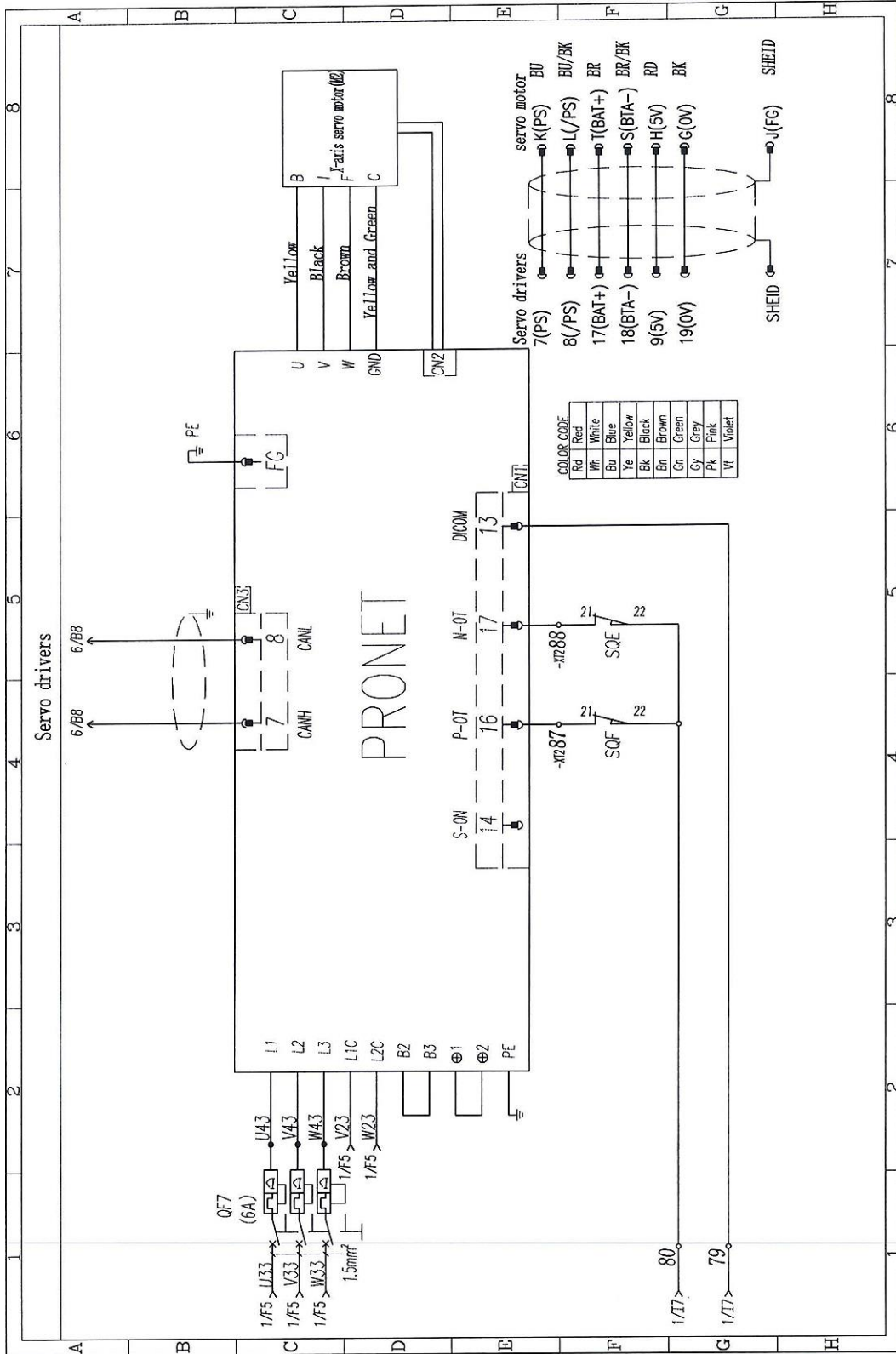
Action of solenoid valve

| Function                | Valve | YA1 | YA2 |
|-------------------------|-------|-----|-----|
| Descent of cutting beam |       | +   |     |
| Return of cutting beam  |       |     | +   |
| Augment cutting angle   |       |     | +   |
| Minish cutting angle    |       | +   |     |

Action of pneumatic valve

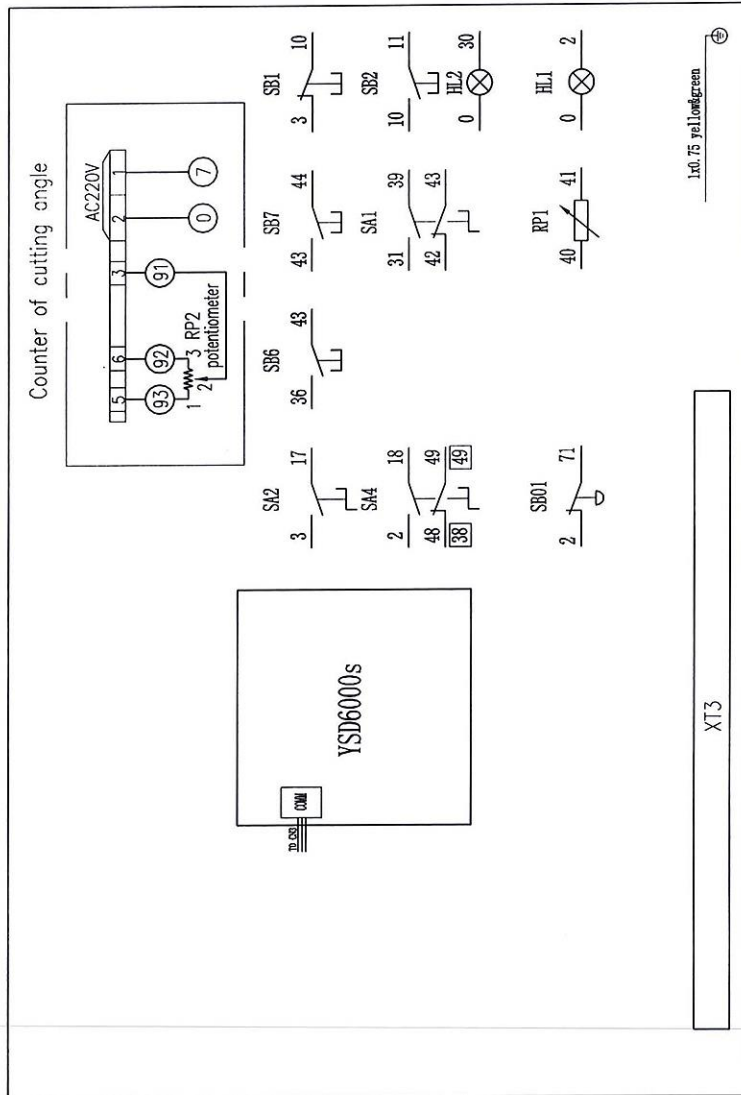
| Function            | Valve | YA11 | YA12 |
|---------------------|-------|------|------|
| Return of carriage  |       | +    |      |
| Descent of carriage |       |      | +    |







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                    |
| HL1-15 | Pilot lights of cutting angle            |
| SA1    | Operating mode (foot-action/once-action) |
| SA2    | Lighting lamps                           |
| SA4    | Numerical control system                 |
| SA5    | PNEUMATIC CARRIAGE CONTROL               |
| RP1    | Potentiometer of cutting                 |
| SB01   | Emergency stop                           |

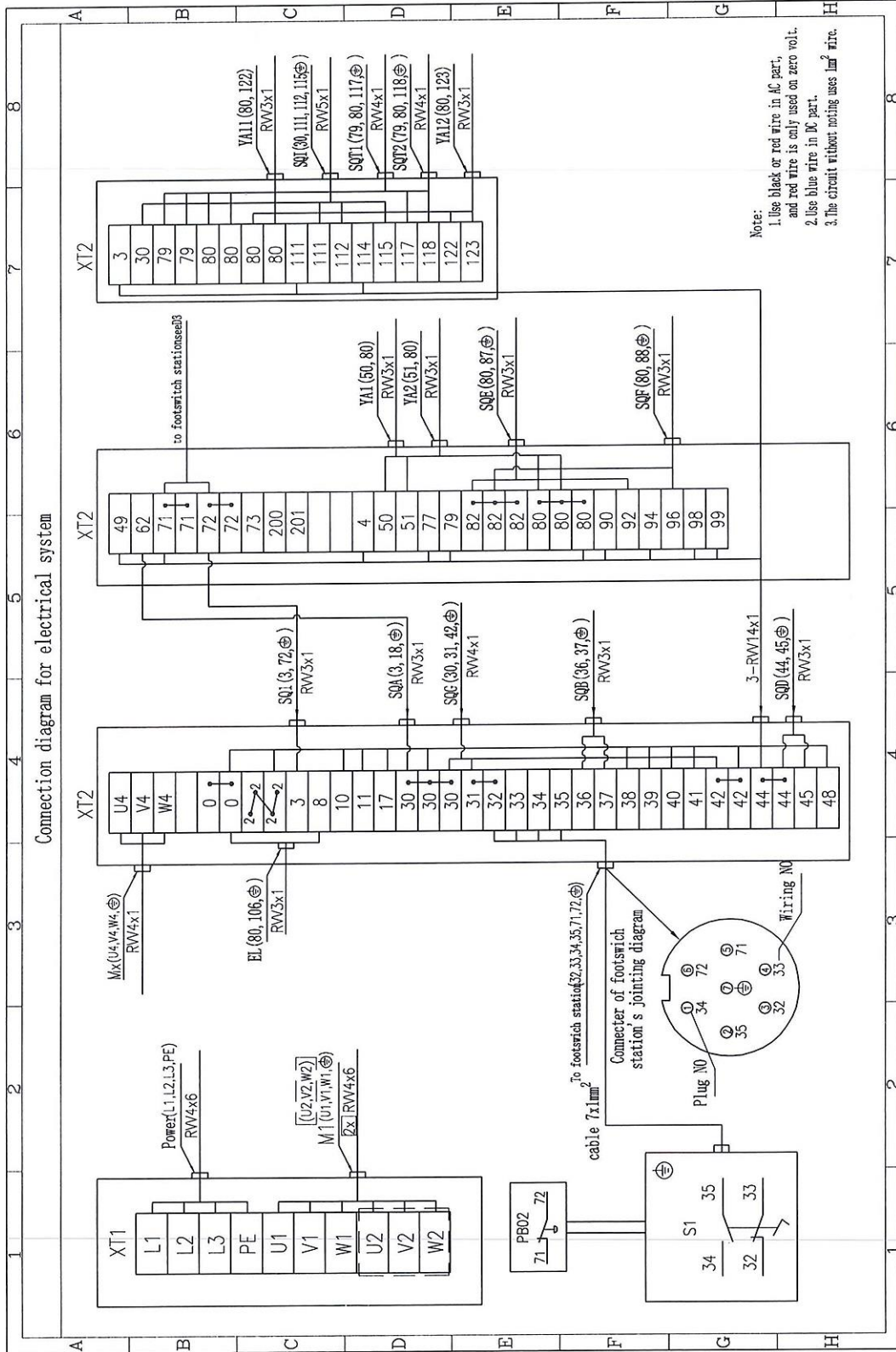
|    |  |    |
|----|--|----|
| 80 |  | 0  |
| 82 |  | 2  |
| 83 |  | 3  |
| 84 |  | 7  |
| 86 |  | 10 |
| 92 |  | 11 |
|    |  | 17 |
|    |  | 18 |
|    |  | 30 |
|    |  | 31 |
|    |  | 36 |
|    |  | 38 |
|    |  | 39 |
|    |  | 40 |
|    |  | 41 |
|    |  | 42 |
|    |  | 44 |
|    |  | 49 |
|    |  | 71 |

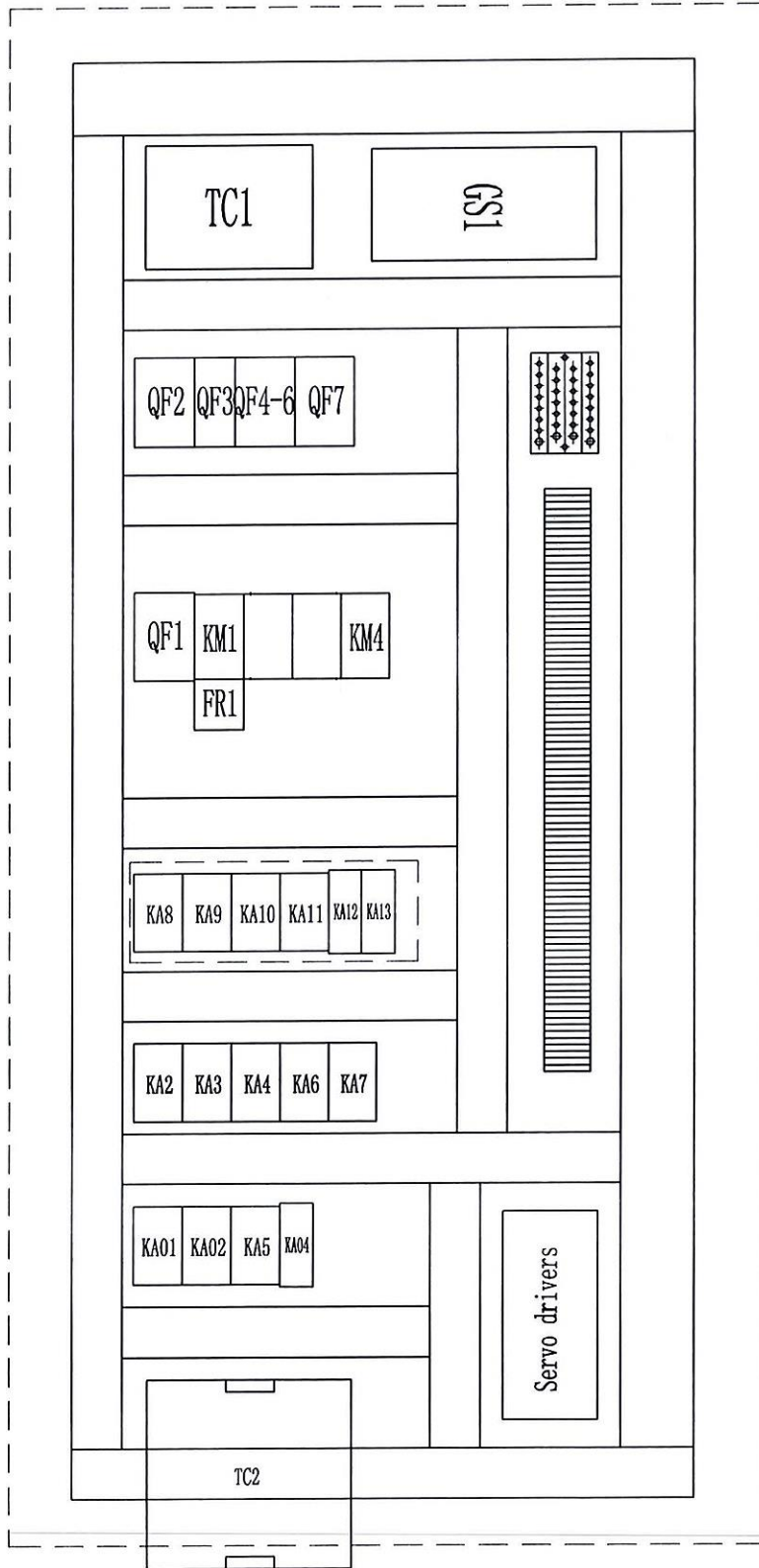
From electrical box to operational station by 2xRWY14x1 cables  
 6x0.75 blue and 17x0.75 black and 1x0.75 red

Wire in operational station

XT3

1x0.75 yellow/green







### Electrical Components List

| Code                        | Type                  | Name              | Specifications                           | Qty. |
|-----------------------------|-----------------------|-------------------|--|------|
| QS                          | V2+KCF1PZ             | Power switch      | 40A                                      | 1    |
| QF1                         | GG45-D40-3P           | Circuit breaker   | 40A, 3P                                  | 1    |
| KM1                         | LC1-D32B7C            | AC contactor      | AC24V, 50-60Hz                           | 1    |
|                             | LAD-N31C              | Auxiliary contact |  | 1    |
| FR1                         | LRD-32C               | Thermo-relay      | 23-32A                                   | 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                         | GG45-D6-3P            | Circuit breaker   | 6A, 3P                                   | 1    |
| GS1                         | S-150-24              | DC power          |  | 1    |
| KA01-02,<br>KA2-4,<br>KA6-7 | CAD-N32B7C            | Relay             | AC24V,50-60Hz                            | 7    |
| KA5                         | CAD-N50B7C            | Relay             | AC24V,50-60Hz                            | 1    |
| KT4                         | RE22R2AMR             | Time delay        | AC24V,50-60Hz                            | 1    |
| KA3                         | LAD-N02C              | Auxiliary contact |  | 1    |
| KA21                        | DRM570024LT           | Relay             | 24V, 10A                                 | 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   |
|                             | SG-1.5-380V/415V-200V | Transformer       | 3-380V/415V,<br>1.5kVA/3-<br>200V,1.5kVA | 1    |
|                             | PRONET-10AMA          | Servo drivers     |  | 1    |
|                             | EMG-10ASB22           | Servo motor       |  | 1    |



|                               |               |                          |       |   |
|-------------------------------|---------------|--------------------------|-------|---|
|                               | YSD6000S      | Numerical control system |       | 1 |
|                               | PAXD          | Counter                  |       | 1 |
| RP1                           | RV30YN20SB203 | Potentiometer            |       | 1 |
| HL1                           | XB2-BVB1C     | Power pilot lamp         | 1     |   |
|                               | ZB2-BS54C     | Push button              | 1     |   |
|                               | ZB2-BZ102C    | Push button              |       | 1 |
|                               | XB 5-AA42C    | Push button              |       | 1 |
|                               | ZB2-BW33C     | Push button              |       | 1 |
|                               | ZB2-BWB31C    | Push button              |       | 1 |
|                               | XB5-AA21C     | Push button              |       | 2 |
|                               | ZB2-BG2C      | Push button              |       | 2 |
|                               | ZB2-BZ101C    | Push button              |       | 4 |
|                               | ZB2-BD2C      | Push button              |       | 1 |
|                               | ZB2-BE102C    | Push button              |       | 1 |
| SQG                           | XCK-M110      | Limit switch             |       | 1 |
| SQA, SQB,<br>SQD, SQH,<br>SQI | XCK-M115      | Limit switch             |       | 5 |
| SQ1                           | XCKN2145P20C  | Limit switch             |       | 1 |
| SQT1-2                        | Q85VR3LP-B    | Photoelectric switch     | AC24V | 2 |





NOTES



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