

# YLSK-25 CNC Spring Forming Machine

## Operation Manual

Guangdong Yonglian CNC Equipment Technology CO.,LTD  
Gate No24 Lvyou Road ,Yonglian Industrial Area ,Shipai  
Town ,Dongguan City,Guangdong Province

Tel.: 0769-39001658

Fax: 0769-39001659

## Overview

YLSK-25 computer numerical control coil spring machine adopts advanced computer control system. The main drive system use a Japanese servo motor to drive the entire machine. It has eight working stations. Each station has a crank arm and a camshaft. It is connected to a slide rail mounting, just like a person who has eight arms to support you at the same time. It can complete the various types of spring specimens and production as you required, and in the work process it is equipped with precision detection and tracking device to ensure the good quality of the spring. It is the ideal equipment for users.

### First, Moving and installation

1. Attention that should be paid to during the handling of the machine: Refer to (Fig. 1). When lifting, use steel wire rope (2) to pass through the two lifting rings (4) at the top of the machine, and make a square wood (3) near the upper part of the lifting ring. The slot is stuck on the wire rope, so that the machine is lifted horizontally and slowly raised. Do not shake or oscillate. If it falls, it should fall slowly. Pay attention to safety. The following is the lifting diagram and the name of the brief part. Pay attention to protect the computer control system (6) and automatic oil pump (8) during handling.
2. The accuracy of the machine is easily to be affected by the environment. It should be installed in a room with air-conditioning. The inside temperature should be between 16° and 26°. It should be clean and hygienic. There should be no impact, vibration or strong magnetic field interference and discharge, etc. The installation ground should be flat, cannot be tilted, maintain the horizontal accuracy between 0.04 - 0.06 / 1000, the four corner

which connect to ground should be flat and strong. Do not shine directly on the machine. It will make the machine deformation, affecting the processing accuracy. You have to clean the various parts of the machine after installation, and then you can turn on the power.

3. Please be equipped with an air compressor if possible

Recommendation: power: 2.2KW, exhaust pressure: 0.8mPa, volume: 80L

L×W×H: 1000×400×750

Second . Other points that need to give attention

1. The computer spring machine is a high-precision equipment and requires high working power. Therefore, we recommend placing this product near places without induction hardening equipment, non-electric welding equipment and major modifications. The interference signals generated by these devices will interfere with the computer controller through the line, causing the computer controller to malfunction or malfunction.

2. First, calculate the total electric power, which should be well matched with the diameter of the power cord (1KW is generally matched with the 0.75mm<sup>2</sup> electric copper wire), and the power cord should match the larger wire diameter as much as possible. Low-power leads are easy to generate heat and cause fire, and the correct use of the equipment cannot be guaranteed.

3. Do not use the device in areas with large fluctuations in power supply voltage or seasonal changes in line voltage. Excessive voltage will burn computer controllers, drives, servo motors and other equipment. If the voltage is too low, the supporting equipment will work in an undervoltage state, which will cause the equipment to work unstable. Therefore, it is recommended to install an AC voltage stabilizer (ie, a voltage

stabilizer) where the voltage is unstable. (CNC642 with AC voltage regulator 14KWA-16KWA)

4. Lightning is an atmospheric discharge phenomenon, and the generation of lightning is likely to lead to major accidents. The impulse voltage of hundreds of thousands or even millions of volts can easily break down the insulation of the equipment, and can be converted into a large amount of heat in a short time, causing fire or explosion. In order to reduce losses, it is recommended to install a lightning protection device (name: AC Power Surge Protective Device, SPD) on the line side (outdoor to indoor).

5. In the production process, in order to prevent accidents and ensure equipment and personal safety, it is recommended to install electrical circuit safety devices. The commonly used electrical safety devices are:

(1) Leakage protection - the leakage protection device should be tested once a month, and the leakage protection capacity should not be too large or too small (in addition, each computer is equipped with an air switch outside the machine to ensure maintenance safety).

(2) Grounding - grounding can be divided into natural grounding and artificial grounding (grounding piles should be checked every 3 months).

① Natural grounding: a reliable building metal structure connected to the earth.

② Artificial grounding: It is made of steel pipe, angle steel, round steel and flat steel.

The grounding material for vertical laying: commonly used steel pipe with a diameter of 40-50mm and a wall thickness of 3.5mm, or angle steel of 40×40×4~50×50×5.

6. Please place the device in a dry, dust-free, electromagnetic noise-free and vibration-free place. Clean the fan mesh (or air pump blowing dust) once a month, and check that the fan circulates the air inside and prevents the temperature from rising.

Check the oil pump system and observe the condition of the oil return pipe. Clean oil and dust from motors, wires and panels daily with a soft, dry cloth. Regularly check whether the wires placed on the ground are deformed or broken, and cut off the power supply when the electrical equipment needs to be checked.

7. Non-professionals are not allowed to repair at will.

永联数控设备有限公司

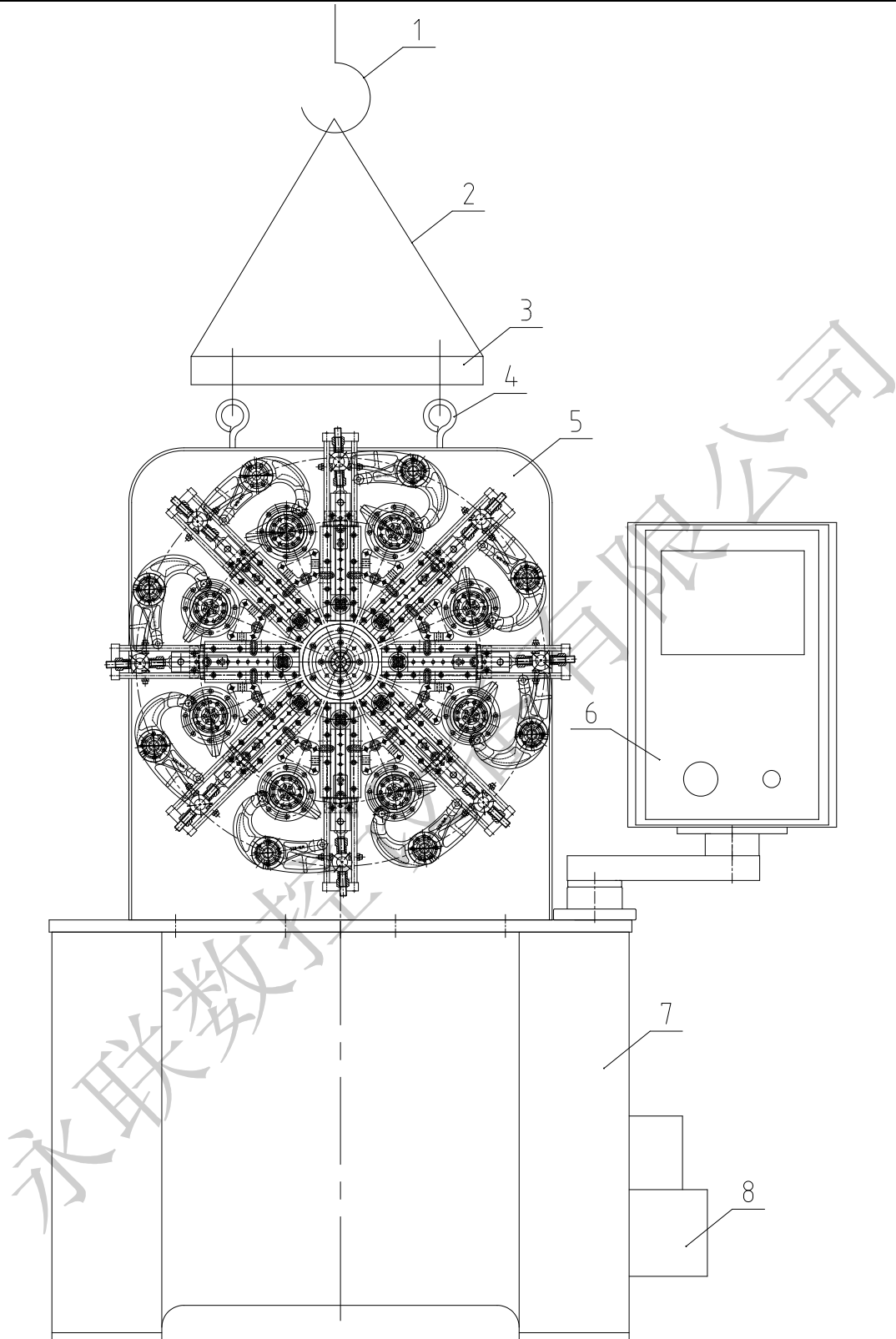


Figure (1)

- |                 |                |                   |                       |
|-----------------|----------------|-------------------|-----------------------|
| 1.Hanging ditch | 3.Square block | 5. Positive panel | 7.Machine             |
| base            | 2.Wire rope    | 4.Ring            | 6.Computer controller |
|                 |                |                   | 8.Automatic oil       |

pump

**Third .TECHNICAL PARAMETERS:**

|   |                      |
|---|----------------------|
| 型号 Model  | YLSK-25              |
| 加工线径<br>Wire Diameter                               | Ø0.2~Ø2.5 MM         |
| 轴数<br>Axis count                                    | 3-5 Axis             |
| 最大送线长度<br>Maximum Feeding Length                    | Unlimited 无限         |
| 最大送线速度<br>Max .wire feed speed                      | 110 M/Min            |
| 凸轮指令值<br>Cam Setting Value                          | ±0.10~±359.90        |
| 送线伺服马达<br>Servo motor of wire feed                  | 2.7 Kw               |
| 凸轮伺服马达<br>Servo motor of cam                        | 2.7 Kw               |
| 转芯伺服马达<br>Servo motor of Z-axis (Quill) servo       | 1.0 Kw               |
| 卷曲伺服马达<br>Servo motor of Coiling Spinner (Optional) | 0.4 Kw               |
| 机体尺寸<br>Machine size                                | 1200x750x1700 MM     |
| 重量<br>Weight  | 850 Kg               |
| 电源<br>Power   | 3-Phase 380V.AC.50HZ |

#### Fourth, the operating machinery part

1. Connect the power supply before starting the machine, fill the oil pump with oil, clean the machine, and do not keep other debris on the machine.

2. First turn on the power switch on the base, then turn on the switch on the controller to make the screen light on, and then use the manual encoder to turn the machine up. Then use the manual spray oil pot to lubricate the eight sliding guides on the front panel. Chute, and then shake two turns without failure.

3. The back part of the machine is the wire feeding part. After the two wire feeding wheels are the straighteners, the center of the straightener, the center of the crimping plate and the center of the rotating shaft are adjusted on the same straight line before leaving the factory. The user does not have to adjust the center. If there is a center misalignment, the user can do the adjustment accordingly.

4. The measuring components equipped with this machine are a group of triplets, one set of single electric two-position five-way valves, four micro-cylinders, and two probes (measuring heads) for users to use precision springs.

5. There are 8 sliding guides on the front panel for the tool holder. This machine is equipped with 4 movable knife holders, 2 inclined knife holders, 4 flat knife holders and 1 cutter holder. They can be mounted separately. On the 8 sliding guides, the operator can select the appropriate seat according to various spring requirements to complete the machining spring task.

6. There are two kinds of holes for the mandrel, namely  $\phi 50\text{mm}$  and  $\phi 34\text{mm}$ . Users can select the appropriate mandrel assembly according to the



diameter of the wire.

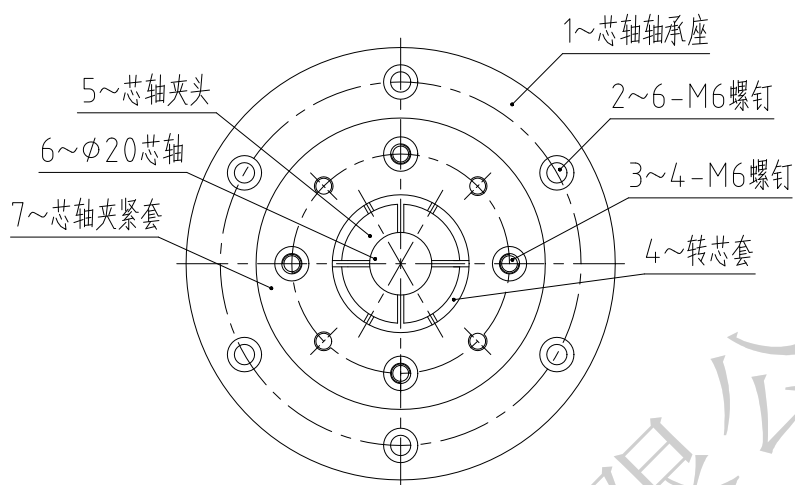


Figure (2)

7. When assembling the  $\phi 34\text{mm}$  mandrel, the accessory CNC635H-04 mandrel chuck is used, the outer diameter is  $\phi 50\text{mm}$ , and the inner hole is  $\phi 34\text{mm}$ .

8. When replacing the mandrel, look at the figure (2), loosen (3) 4 nos of M6 screw mandrel clamping sleeve 7 and the shaft taper on the shaft sleeve 4 is loosened, pull out the  $\phi 50$  or  $\phi 34$  mandrel, reload on the top, tighten the four M6 screws.

9. The curve gauge and mandrel used in the coil spring are all prepared according to the diameter of the steel wire. Each type of diameter wire is equipped with a curve gauge and a mandrel. The user can select it according to requirements.

10. The principle of loading the wire: before the put spring, the steel wire is introduced into the straightener (1) from the wire feeding frame, and then the pressure roller (5, 7) is pressed from the mandrel (6, 8) from the mandrel (10).

See if the wire is straight, and if the wire is bent, then the spring cannot be hit, and it must be straightened continuously by the straightener until it is basically straight. However, the most important thing to install steel wire is the four-core straight line, that is, the center of the straightener, the center of the crimping plate, the center of the pressure roller, and the center of the mandrel hole. The operator can adjust the machine according to this principle. Please see the diagram (3).

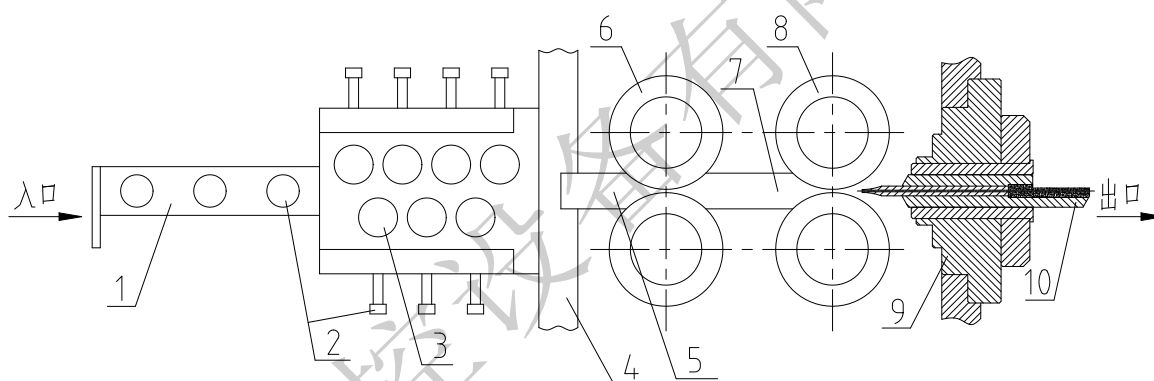


Figure (3)

11. If the two pairs of wire reels are different, how to adjust? Please refer to the figure (4) to adjust the 2 and 3 parts with the hex wrench, and the wire feeding shaft will move up and down accordingly, so as to adjust the wire feeding groove of the wire feeding wheel and the center of the mandrel in one line to achieve smooth wire feeding.

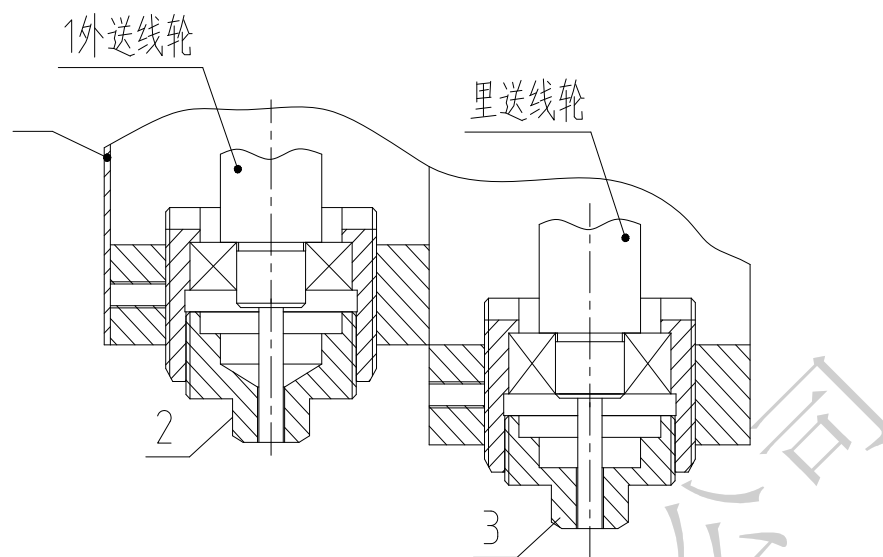


Figure (4)

12. The measuring part is also called the pneumatic part. It is set by the machine according to the length of the spring and the various spring torsion angles. It consists of a set of triple body, two-position five-way solenoid valve and Valve Island, and is mounted on the base. On the right side, a miniature cylinder and a probe are assembled together to form a precision detector. The detector is mounted on the base panel with a pole, aligned with the work piece to be tested, and controlled by a computer controller. Work piece accuracy, but a certain number of defective products must always appear in the processing of a batch of products. In order to ensure the quality of products, it is necessary to limit the occurrence of defective products, so a certain number of defective products are placed on the computer controller to give restrictions. When the machine reaches the preset value during the machining process, the machine will automatically stop, you can check the cause, handle the discharge failure, if the electrical fault can open the back cover of the base, check the alarm display code above the drive, and then the alarm The display table is processed for

comparison.

Fourth Safety, maintenance.

1. The machine must be maintained during use in order to maintain stable accuracy and life. The operator must inject oil to the three oil nozzles of the crank arm every 24 hours when start the machine, and eight slide rails on the base panel. Spray the lubricating oil with the chute once or twice a day, and remove the dirt on the surface and the surrounding area after work.

2. When winding the spring, be sure to follow the specified wire diameter. Do not increase the diameter arbitrarily to avoid the machine damage. When calculating the profile, the equivalent area of  $\phi 2$  can be calculated.

3. During operation, the operator is not allowed to put hand into the machine, and it is not allowed to extend the iron into the machine to clean the springs and other objects. Because the machine is running fast, pay special attention to accidents. If you find emergency at work, you can stop immediately and then deal with the failure.

4. In addition to keeping clean and hygienic in the studio (computer room), do not directly shine on the machine, do not allow to heat any items inside room, and keep the normal working temperature inside the room (between  $16^{\circ}$  and  $26^{\circ}$ ). No dust is allowed.

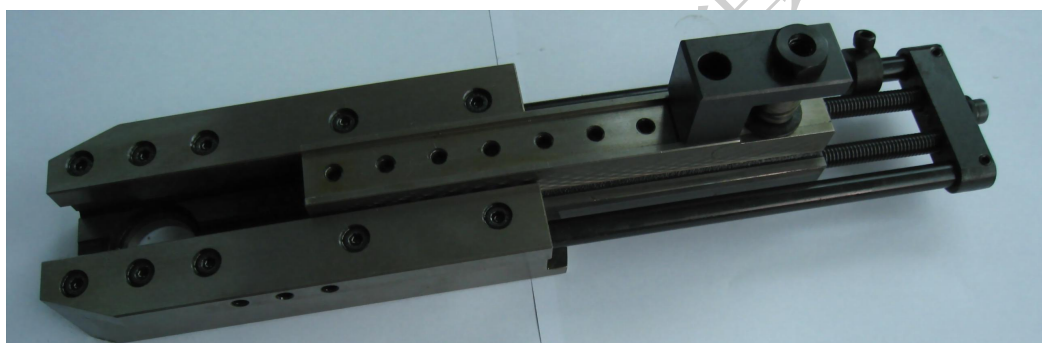
YLSK-25 spring machine is composed of imported raw materials and precision parts. To maintain machine accuracy, lubricate and maintain machine components as described below.

For daily maintenance, please pay attention to the following:

- ① Please keep the machine clean to ensure the accuracy and life of the machine.
- ② Clean machine parts with cloth and towel.
- ③ Do not use an air gun to clean the crank and slider, so as to prevent iron chips or dirt from falling into the chute and the clearance of the rotating structure.

### I Sliding parts

Lubrication is required twice a day. The slider is a precision sliding part, it is best to use HG32# original packaging guide oil or super viscous diesel oil (such as CD 10W-40)



### II Crank arm part

Add grease to the grease port of the bearing sleeve every two weeks. (NSK GREASE LG 2 made in Japan).



### III Cam drive system and motor fuel injection device

Be sure to replace the new HG32# guide oil in the original packaging after about 1000 hours of use (about 2 months). The system must be maintained every six months, please

follow the steps below:

First cut off the power, then open the oil drain bolt at the bottom of the motor oiler at the bottom right of the machine to allow the old oil to drain completely. Tighten the oil drain bolt and add new circulating oil (the system is suitable for HG32# guide oil).

NOTE: To fully lubricate the gear drive system, keep the machine running for five minutes before starting work.



Cam drive system



motor fuel injection device



Gear drive system

备有限公司



It is recommended to use gear oil GB5903. Special oil for feeding box, gear box, spool and reducer

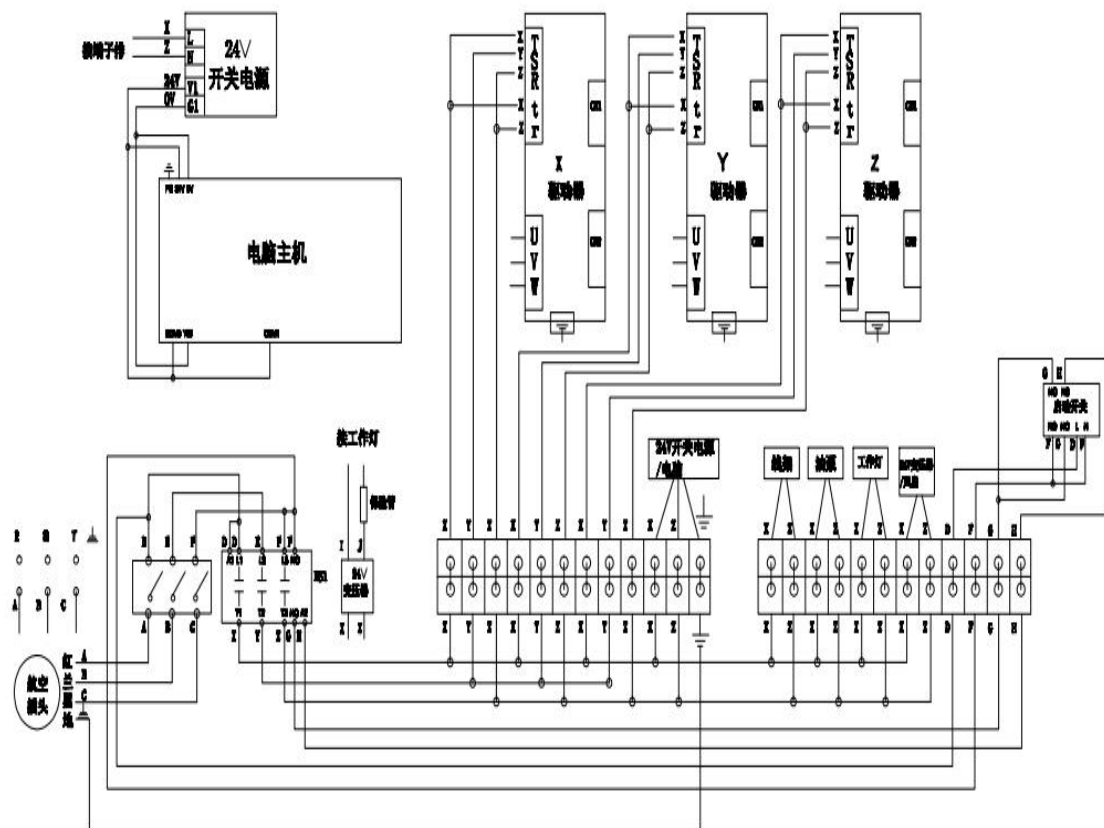


Y012 Anti-rust oil



## 6. Circuit wiring diagram

永联数控弹簧机接线图



- 注意：1、此图为3相220V或2相220V通用接线图。  
 2、R、S、T、地线颜色对应使用红、蓝、黑、黄绿，接线要求美观大方。  
 3、380V电源输入必须外接变压器。

### 永联数控弹簧机接线图注解

Note of Wiring diagram of Yonglian CNC spring machine

接端子排：Connecting terminal block:

开关电源：Power

电脑主机：Computer controller

接工作灯： Connect work lights:

保险管： Fuse:

变压器： Transformer:

红，兰，黑，地： Red, blue, black, Earth wire

航空插头： Aviation plug:

驱动器： Drive

驱动器： Drive

驱动器： Drive

24V 开关电源/电脑： 24V Power / Computer

线架： Decoiler

油泵： Oil pump

工作灯： working lamp

24V 变压器： 24 v transformer

风扇： Fan

启动开关： Start switch

注意： 1.此图为 3 相 220V 或 2 相 220V 通用接线图

2. R.S.T.底线颜色对应使用红，蓝，黑，黄，绿，接线要求美观大方

3. 380V 电源输入必须外接变压器。

Note: 1. This picture is the general wiring diagram for 3-phase 220V or 2-phase 220V

2. The color of the bottom wire of R.S.T. corresponds to the use of red, blue, black, yellow, green color .Wire connection should be easy and good looking.

3.380V power input must be connected to a transformer.