

# YLSK-20 型电脑数控卷簧机

YLSK-20 CNC Spring Forming Machine

## Operation Manual

## 使用说明书

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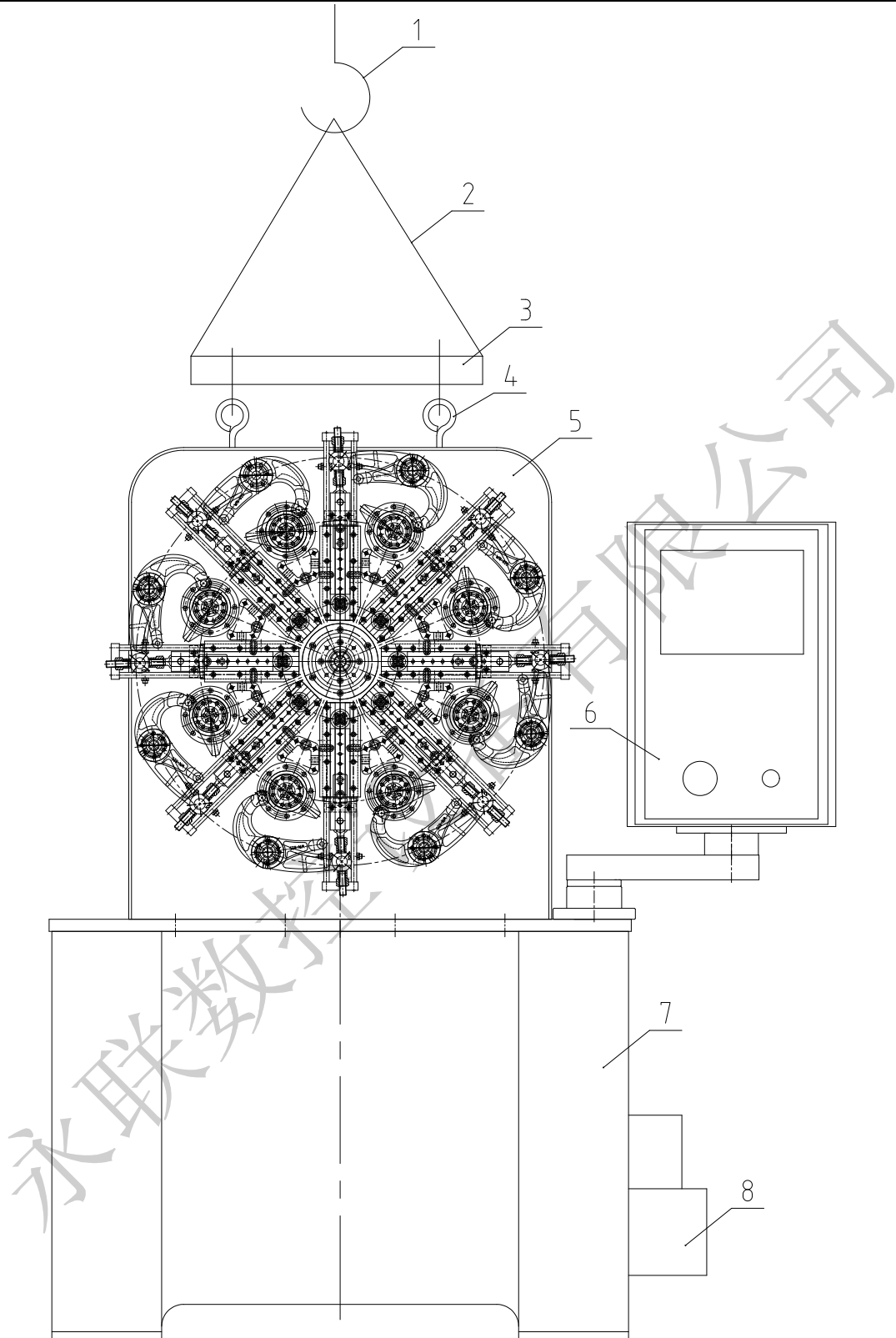
## 概 述

YLSK-20 型电脑数控卷簧机是采用先进的电脑控制系统。主传动采用日本伺服电机驱动整台机械运转，它设有八个工作位置，每个工位上有一个曲臂和一个凸轮轴，联接一个滑轨座，就象一个人有八支手臂在同时工作一样去完成你所要求的各类形弹簧试样和生产，在工作过程中并设有精度检测跟踪装置，保证弹簧品质优良，是用户的理想设备。

### 一、搬运与安装

1、机器在搬运过程中应注意的问题：参见（图一）起吊时用钢丝绳（2）从机器顶部二个吊环（4）孔中串过，靠近吊环上部用一个方木（3）做成槽卡在钢丝绳上，使机器水平吊起慢慢升高，不要摇晃、摆动，下落时也要慢慢的下落，注意安全、下面是吊运示意图及简要部件名称，搬运时注意保护好电脑控制器（6）和自动油泵（8）。

2、本机精度受环境影响很重要，一般应安装在一间有空调气的房间中，室内温度控制在  $16^{\circ}$ — $26^{\circ}$  之间为宜，保持卫生洁净，周围不能有冲击、振动、更不能有强磁场干扰及放电等，安装地面要平整，不能倾斜，保持水平精度在  $0.04$ — $0.06/1000$  之间，四角接地面要平、牢，注意不要太阳光直接照在机器上，以免机器局部变形，影响加工精度，安装完毕再清理机器各部件，然后就可以接通电源。



图（一）

- |       |       |         |        |
|-------|-------|---------|--------|
| 1、吊沟  | 3、方木块 | 5 正面板   | 7、机底座  |
| 2、钢丝绳 | 4、吊环  | 6、电脑控制器 | 8、自动油泵 |

## 二、技术规格

型 号	YLSK-20
卷制钢丝直径	$\Phi 0.3 - \Phi 2.5 \text{ mm}$
加工速度 (件/min)	60
送线指令值	$\pm 0.01 - \pm 9999.99$
凸轮指令值	$\pm 0.1^\circ - \pm 359.9^\circ$
送线伺服马达	2.7KW
凸轮伺服马达	2.7KW
转芯伺服马达	1KW
机器尺寸 (mm)	1600×700×1700
电源	380V 50HZ
重量	850kg

## 三、操作机械部份

1、开机前应接好电源，把油泵注满油，机器清洗干净，机器上不应保留其它杂物。

2、先打开底座上的电源开关，再打开控制器上的开关，使荧光屏亮起来，再用手动编码器使机器转动起来，这时用手动喷雾油壶润滑正面板上的八个滑动导轨和滑槽，再摇二转无故障为止。

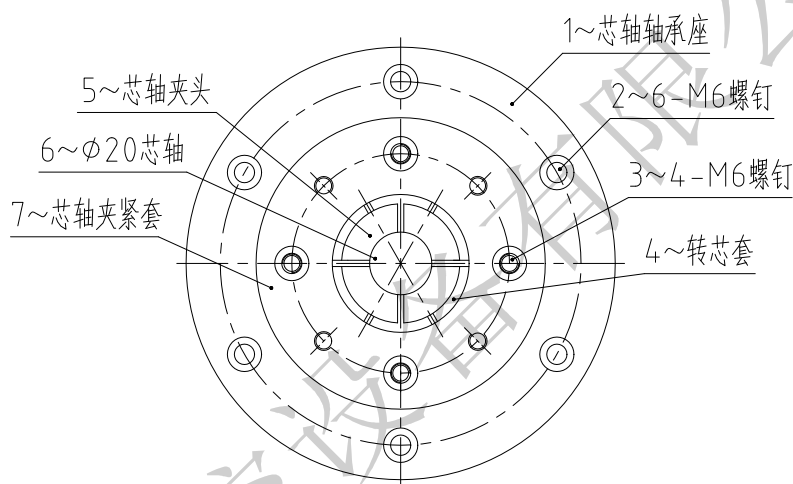
3、本机背面是送线部分，在二个送线轮后边是校直器，本机出厂前已将校直器中心、压线板中心、转轴中心，调整在同一条直线上。用户不必再调校中心，如有中心错位时用户可自行调校。

4、本机配备的测量部件有三联体一组、单电二位五通阀一组，微型

气缸四个，探针二个（测量头）供用户做精密弹簧时使用。

5、在正面板上有 8 个滑动导轨是装刀座用的，本机配备活动刀座 4 个、斜刀座 2 个、平面刀座 4 个、切刀座 1 个，它们可以分别装在 8 个滑动导轨上，操作者可按各种弹簧要求选择合适的刀座，去完成加工弹簧任务。

6、装芯轴的孔有二种即  $\phi 50\text{mm}$  和  $\phi 34\text{mm}$ ，用户可根据钢丝直径大小去选择适当的芯轴装配。



图（二）

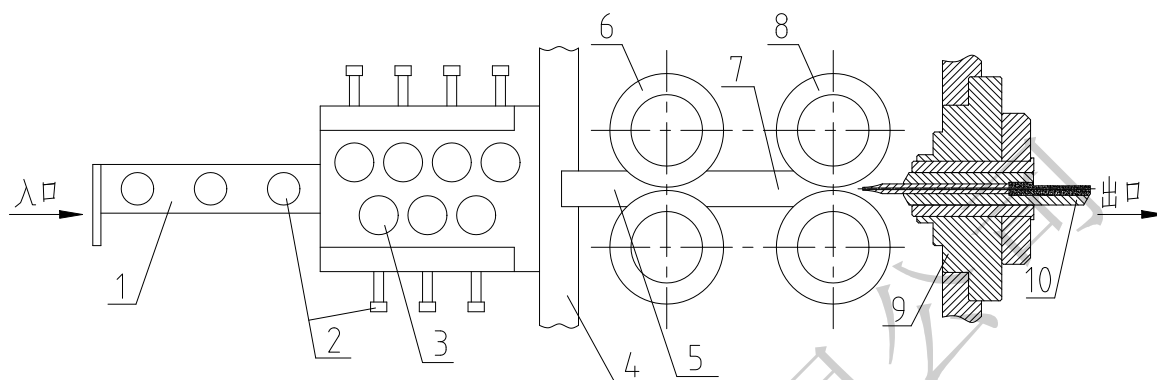
7、装配  $\phi 34\text{mm}$  芯轴时，采用附件 CNC635H-04 芯轴夹头，其外径为  $\phi 50\text{mm}$ ，内孔为  $\phi 34\text{mm}$ 。

8、更换芯轴时看图（二）说明，拧松（3）4 个 M6 螺钉芯轴夹紧套 7 与轴芯套 4 上的配合锥度就松开，抽出  $\phi 50$  或  $\phi 34$  芯轴，重新装上，拧紧 4 个 M6 螺钉即可。

9、卷簧时所用的曲线规和芯轴都是按钢丝直径配制的，每一种规格直径的钢丝配一个曲线规和一个芯轴、用户可根据要求选用。

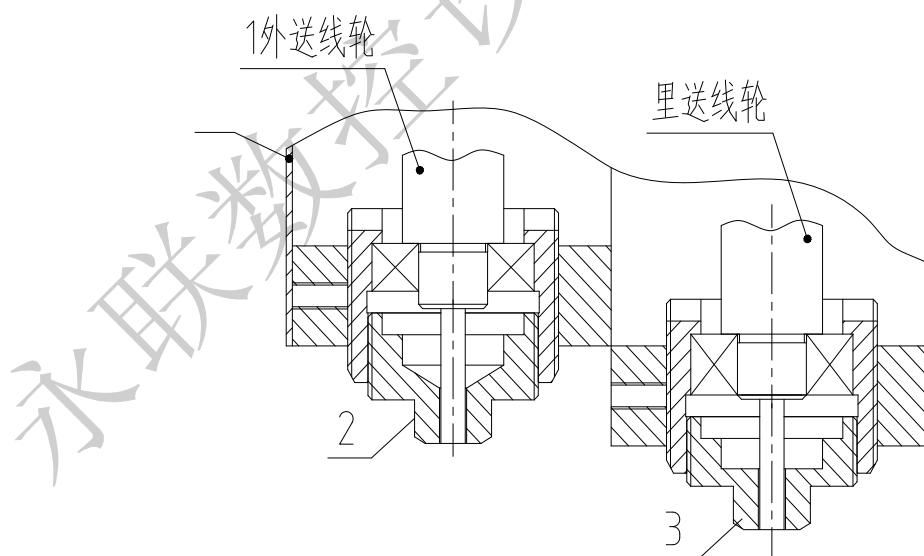
10、装线的原则：打簧前从送线架上把钢丝引进校直器（1）中，再通过压线板（5，7）压线轮（6，8）从芯轴（10）通过，看钢丝是否校直，

如钢丝弯曲就不能打弹簧，须再经过校直器反复校直，达到基本直挺为止。但装钢丝最重要的是四心一直线，即校直器中心、压线板中心、压线轮中心、芯轴孔中心，操作者可以根据这个原则进行调机。请看示意图（三）。



图（三）

11、如果两对送线轮不同心又怎样调法呢？请参看图（四）用外六角扳手调节 2、3 零部件，送线轴随之上下移动，从而调节送线轮的送线槽与芯轴中心在一条线，达到顺利送线。



图（四）

12、测量部份也叫气动部份，是本机配合打弹簧长度和打各种弹簧扭转角度而设定的，它由一组三联体、二位五通电磁阀和阀岛组成一体，装在底座右侧方，再用一只微型气缸和一只探针配装在一起就成为一个精密探测器，此探测器用表杆装在基面板上，对准被测工件部位，用电脑控制器给予控制工件精度，但是加工一批产品总要出现一定数量的不良产品，为保证优质产品，必须限制不良产品发生，所以在电脑控制器上预设一定数量的不良品，给以限制。机器在加工过程中达到预设值，机器会自动停机，你就可以查其原因，进行处理排出故障，要是电气故障可以打开机底座后盖，查看驱动器上方报警显示字码，再和后面的报警显示表对照进行处理。

#### 四、安全、保养、维护

1、机器在使用中必须加以维护保养，才能长期保持稳定的精度，和使用寿命，操作者在开机时必须每隔 24 小时往曲臂三个油嘴上注一次油，基面板上八个滑轨和滑槽用喷雾润滑油每天一、二次，工作完毕要清除表面和周围的污物。

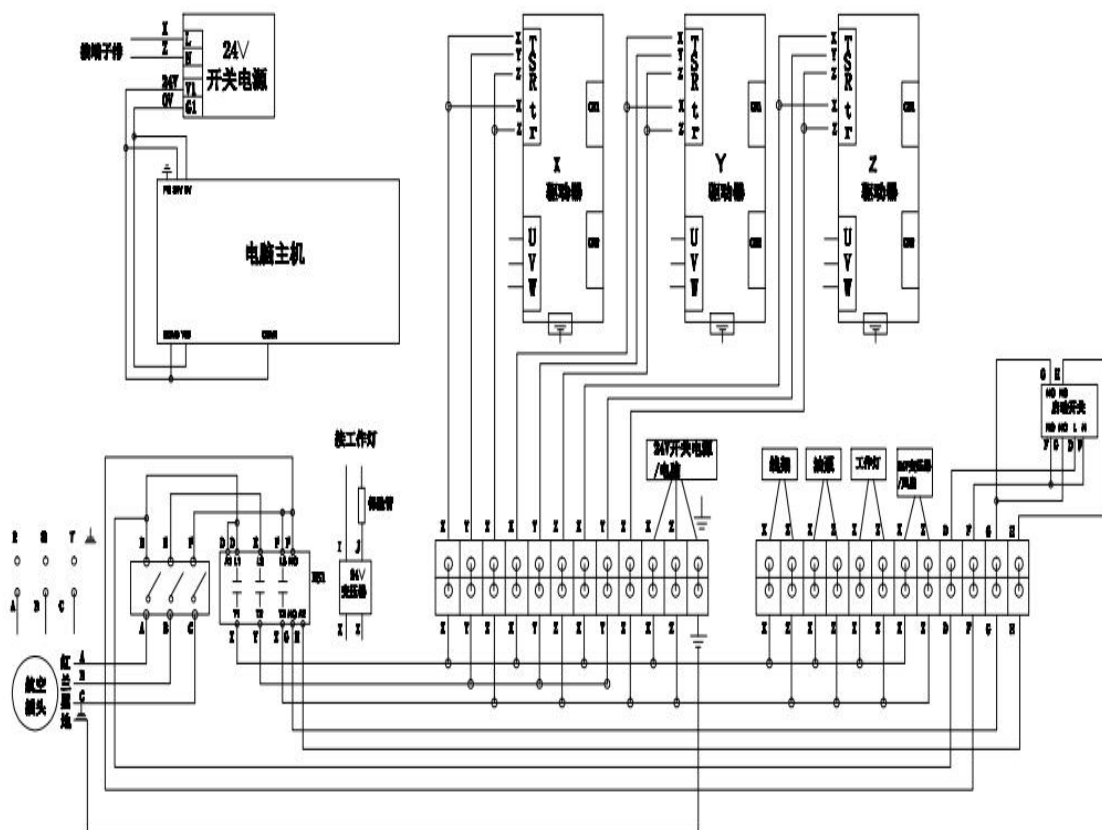
2、在卷制弹簧时一定要按规定的钢丝直径，不要随意加大直径，以免损坏机器，作异型材时按照  $\phi 2$  的同等面积计算即可。

3、在工作时操作者不准把手伸进机器内，更不准把铁器伸入机器内去清理弹簧等物件，因机器在运转时速度很快，特别注意不要出事故。如在工作中发现有问題可以立即停机然后再处理故障。

4、工作室（电脑机房）内除了保持清洁、卫生外，不要阳光直接照在机器上，不准在室内加热任何物品，要保持室内正常工作温度（ $16^{\circ}$  —  $26^{\circ}$  之间）最佳，不准有任何灰尘。

#### 二十二. 电路接线图

### 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。



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## Overview

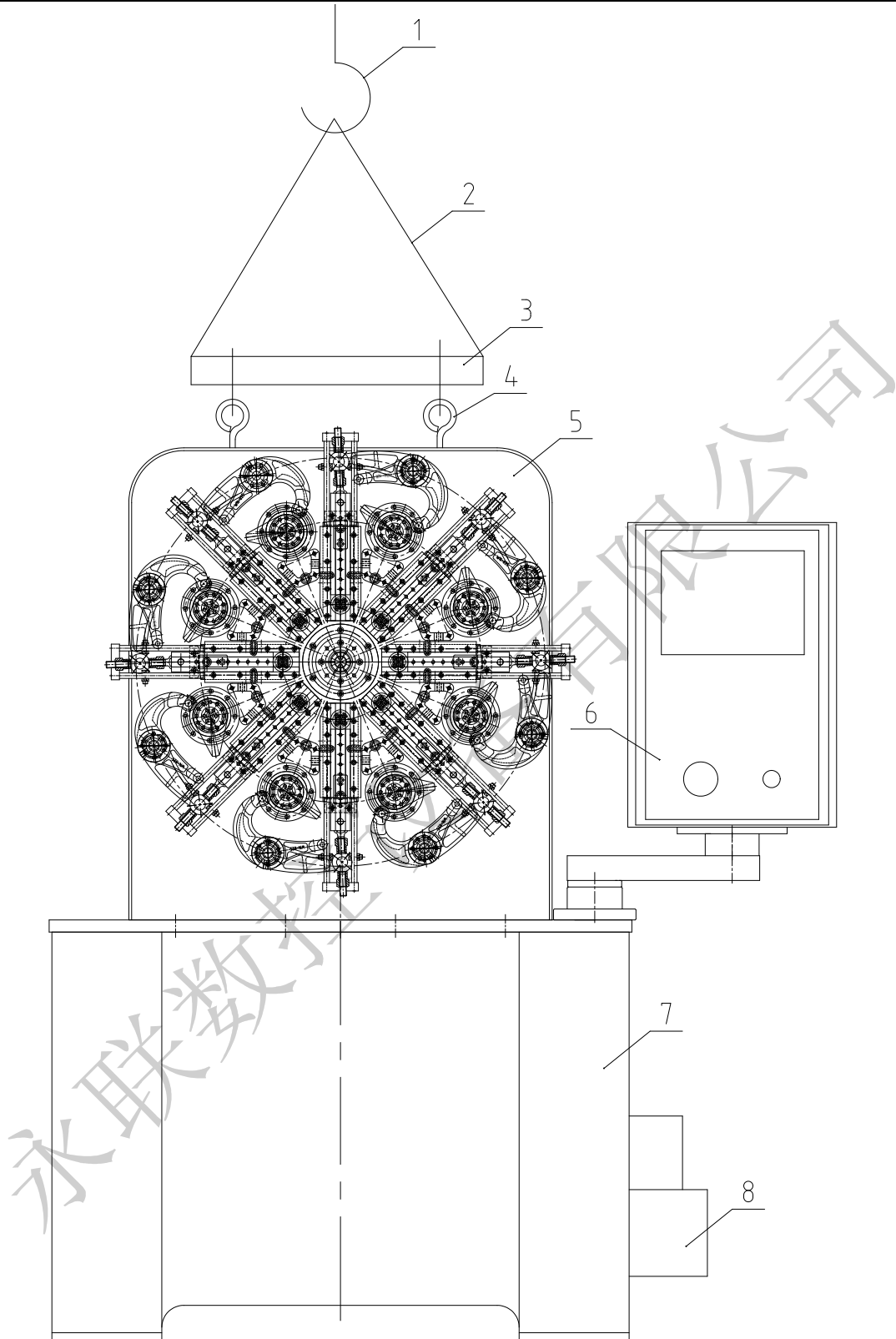
YLSK-20 computer numerical control coil spring machine adopts advanced computer control system. The main drive system use a Japanese servo motor to drive the entire machine. It has eight working stations. Each station has a crank arm and a camshaft. It is connected to a slide rail mounting, just like 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.

永联数控设备有限公司



Hanging ditch 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

## Second. Technical specification

Model	YLSK-20
Coiled wire diameter	Φ0.3-φ2.5 mm
Processing speed (ps/ min)	60
Wire feed command value	±0.01-±9999.99
Cam command value	±0.1°-±359.9°
Wire servo motor	2.7KW
Cam servo motor	2.7KW
Rotary core servo motor	1KW
Machine dimension (mm)	1600×700×1700
Power	380V 50HZ
Weight	850kg

Third, 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.

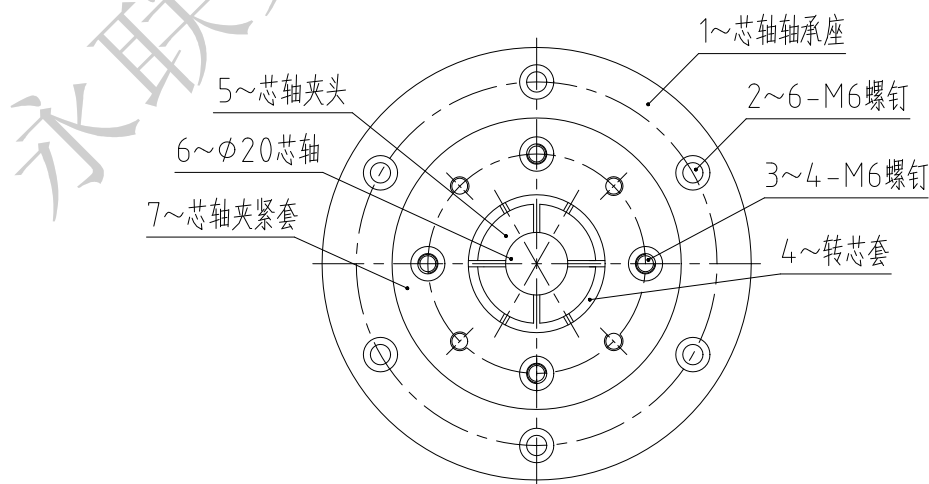


Figure (2)

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).

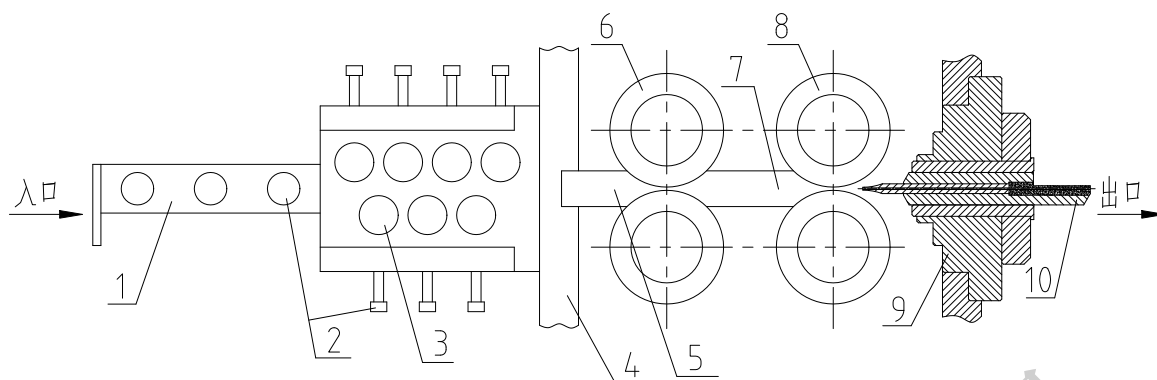


Figure (3)

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.

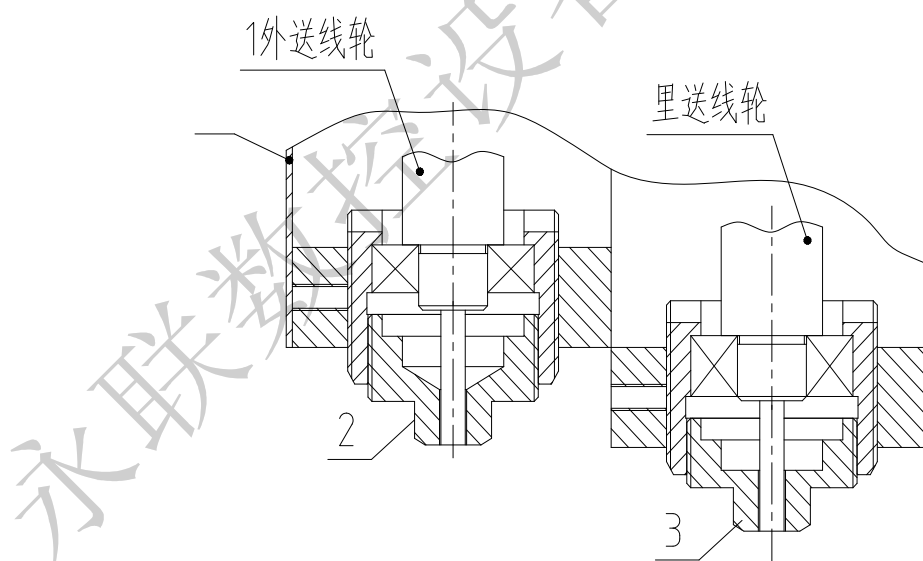


Figure (4)

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.

Forth. Safety, maintenance, 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 ° and 26 °). No dust is allowed.

Note: The final interpretation right belongs to the company.

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