

YLSK-1240 型 无凸轮电脑万能机

YLSK-1240 CNC Camless Spring

Forming Machine

Operation Manual

使用说明书

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# 概 述

YLSK-1240 无凸轮转线弹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，每个工位上有一个伺服电机和一个行星减速机，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，同时配备转线功能，使其产品多样化，制作空间角度产品更快速，本机可增加卷曲装置和伺服剪刀装置，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）搬运时用叉车（2）从机器底部穿过，注意平衡，使机器水平叉起慢慢升高，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（7）和手臂伺服马达，高楼层要用专业吊车工具作业。

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。

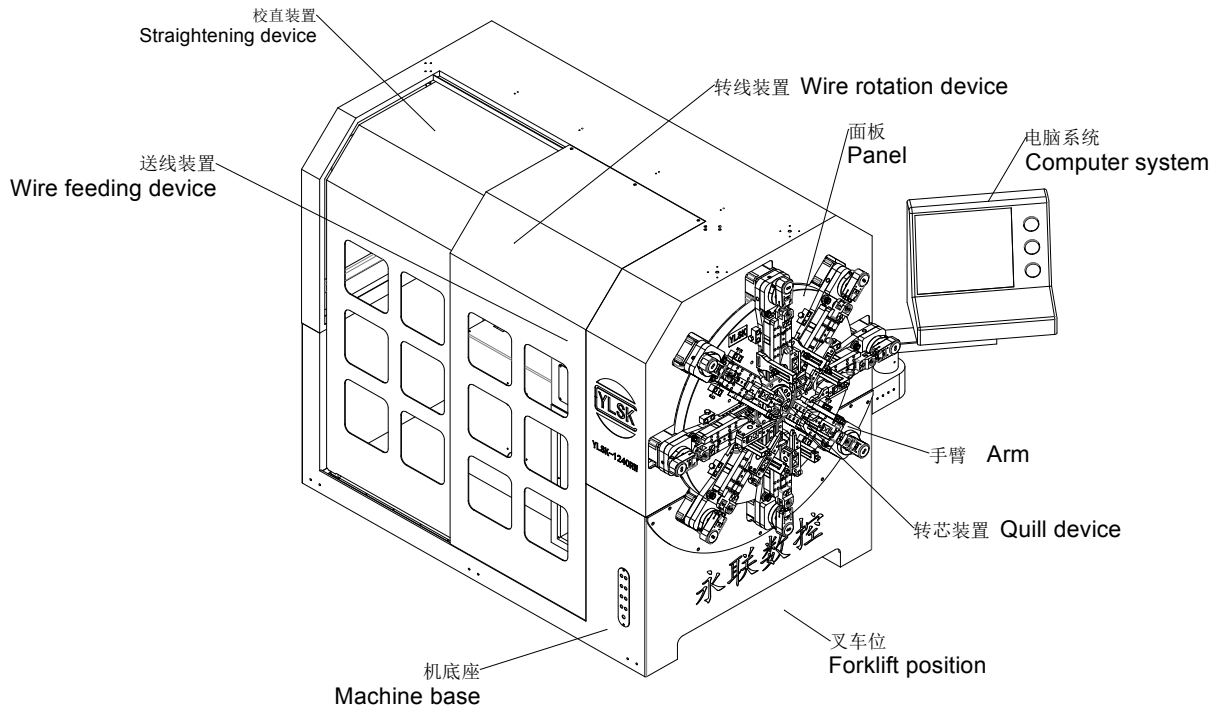


图 (一)

- |        |      |        |        |
|--------|------|--------|--------|
| 1、叉车位  | 3、面板 | 5、转芯装置 | 7、电脑系统 |
| 2、机底座  | 4、手臂 | 6、送线装置 | 8、转线装置 |
| 9、校直装置 |      |        |        |

## 二、技术规格

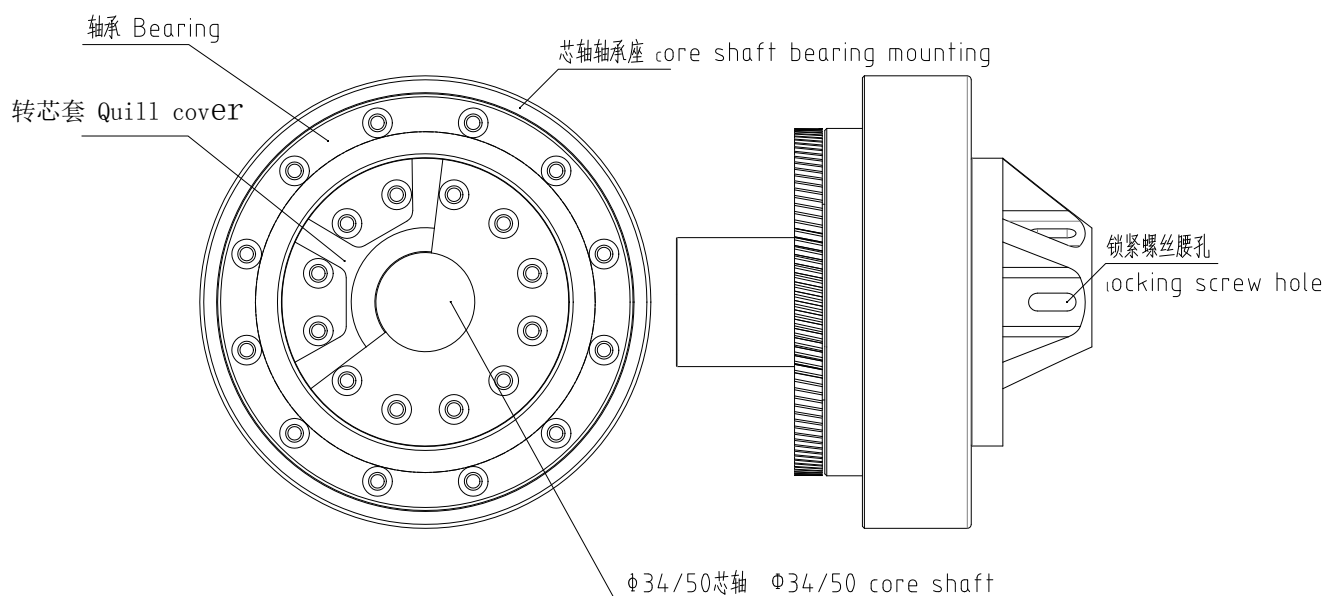
型号 Model	YLSK-1240
加工线径(mm) Machining wire diameter	Ø0.8~Ø4.0
轴数 Axis Count	12 Axis
送线长度 Max feeding Length	Unlimited
工序数据储存量 Program Storage	999 Max
送线指令值 Instruction value of wire feed	±0.01~±9999.99mm
凸轮指令值 Instruction value of cam	±0.10~±359.90
送线伺服马达(kw) Servo motor of wire feed	5.5
凸轮伺服马达(kw) Servo motor of slide	8×1.2
转线伺服马达(kw) Servo motor of Quill (Z-axis)	2.7
转芯伺服马达(kw) Servo motor of Quill (Z-axis)	1.0
卷曲伺服马达(kw) Servo motor of Coiling Spinner (optional)	1.0
机体尺寸 Machine size (LxWxH) (mm)	2400×2000×1900
重量 Weight (kg)	3500
电源 Power	380V 3-Phase

## 三、操作机械部份

- 1、开机前应接好电源，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，使荧光屏亮起来，再用手动模式使机器转动起来，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和转线装置，在转线装置后边是校直器，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，微型气缸二个，探针二个（测量头）供用户做精密弹簧时使用。
- 5、在正面板上有八个滑动导轨是装刀座用的，本机配备活动刀座 6 个、45° 斜刀座二个、直刀座二个、模板座二个，它们可以分别装在八个

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）

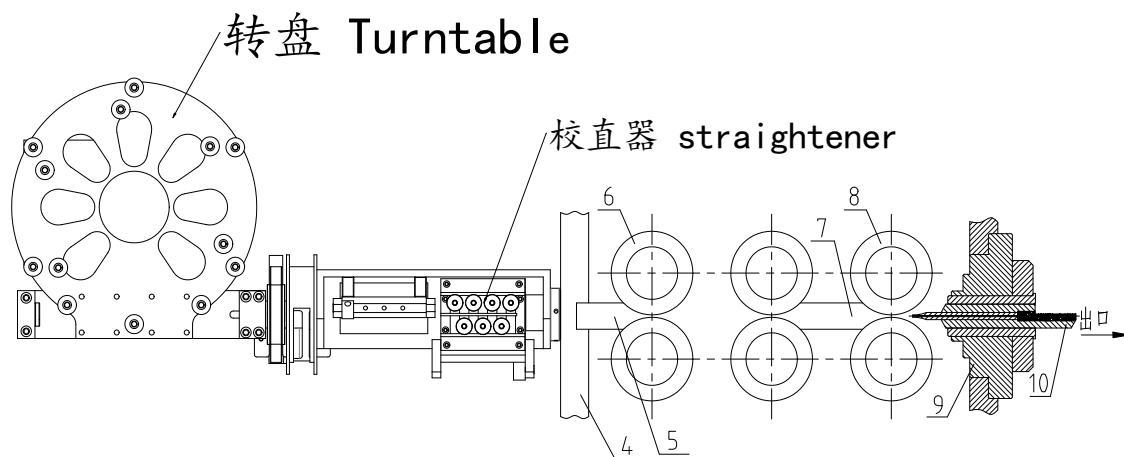
7、装配  $\phi 20\text{mm}$  芯轴时，采用附件芯轴夹头，其外径为  $\phi 50\text{mm}$ ，内孔为  $\phi 34\text{mm}$ 。

8、更换芯轴时看图（二）说明，拧掉上面 2-M8 锁紧螺丝，抽出  $\phi 50$  或  $\phi 34$  芯轴，重新装上，拧紧 2 个 M8 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。

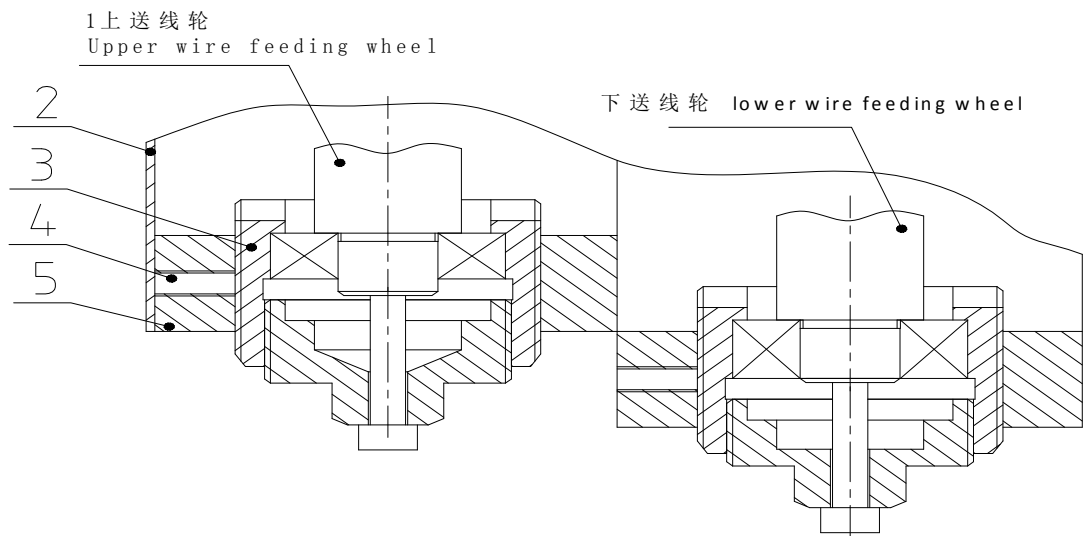
10、装线的原则：打簧前从送线架上把钢丝引进转盘，通过校直器中，再通过压线板（5，7）压线轮（6，8）从芯轴（10）通过，看钢丝是否校直，如钢丝弯曲就不能打弹簧，须再经过校直器反复校直，达到基本直挺

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），可以看见每对压线轴一端用压紧板紧固，先松开压紧板，用扳手扣在转动螺柱（3）上，使送线轴上下移动，对准压线轮沟槽中心，当两对压线轮槽中心对齐后，再紧固盖板，调正完毕装上后盖，其它件不变动。



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（SGDM）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做安全检查，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。

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° — 26° 之间）最佳，不准有任何灰尘。

YLSK-1240 camless spring forming machine adopts advanced computer control system. The main drive uses a Japanese servo motor to drive the entire machine . It has eight working positions. Each station has a servo motor and a planetary reducer, connected to a slide rail seat, just like a person has eight arms. At the same time, you can complete the various types of spring samples and production as you required. At the same time, it is equipped with a line transfer function to diversify its products and make spatial angle products faster. This machine can add a curling device and a servo scissors device to work. In the process, a precision detection and tracking device is installed to ensure the high



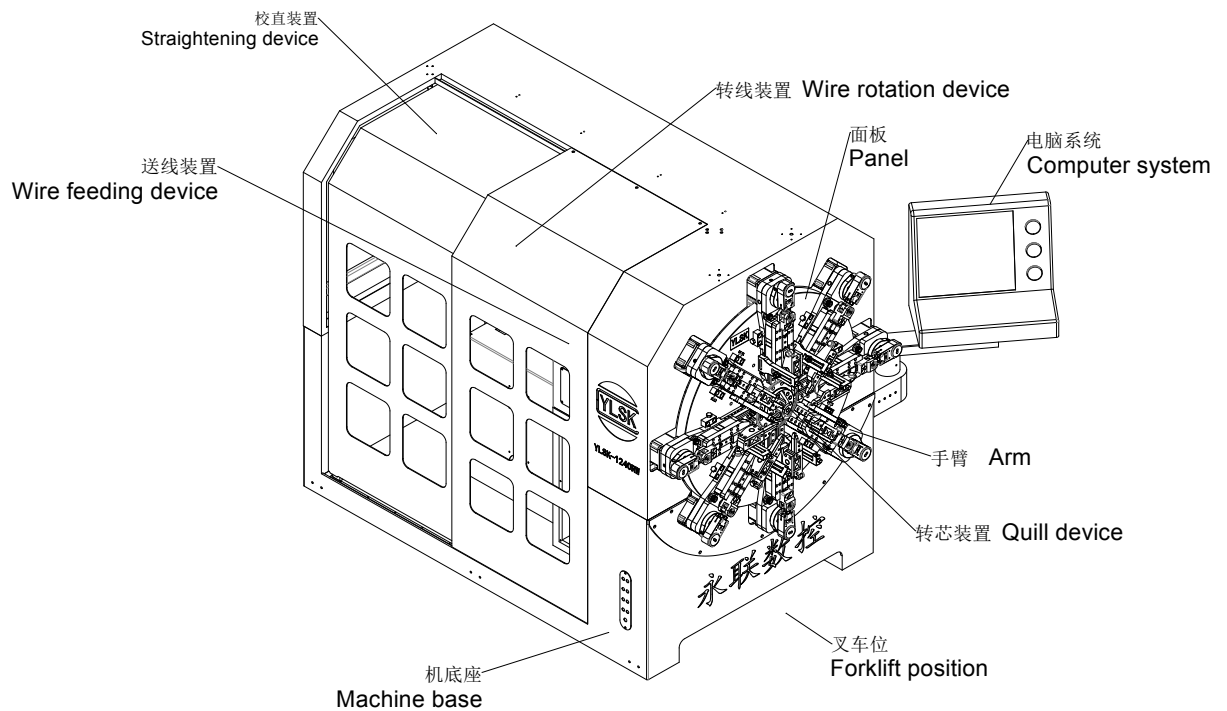
quality of the spring, which is an ideal equipment for users.

### **First .Handling and installation**

1. Problem that should be paid attention to during the handling of the machine: see (Figure 1) Use a forklift when handling (2) Pass through the bottom of the machine, pay attention to balance, make the machine level up and slowly rise, do not shake, swing, and drop Also fall slowly, pay attention to safety, the following is the lifting diagram and brief part names, pay attention to protect the computer controller (7) and arm servo motor when moving, and use professional crane tools to work on high floors.

2. The environment of this machine is very important to the accuracy . Generally, it should be installed in an air-conditioned room. The indoor temperature should be controlled between 16° and 26°. Keep it clean and clean. There should be no impact, vibration, There must be no strong magnetic field interference and electric discharge, etc. The installation ground must be flat, not inclined, and the horizontal accuracy must be between 0.04 and 0.06/1000. The four-corner grounding surface must be flat and firm. Be careful not to directly shine the sun on the machine to encourage the machine Partial deformation affects the processing accuracy. After the installation is completed, the parts of the machine are cleaned, and then the power can be turned on.

Figure (1)



1. Forklift position 3. Panel 5. Quill device 7. Computer system
2. Machine base 4. Arm 6. Wire feeding device 8. Wire rotation device
9. Straightening device

## Second Technical specifications

Model YLSK-1240

Machining wire diameter (mm)  $\text{Ø}0.8 \sim \text{Ø}4.0$

Axis Count 12 Axis

Max feeding Length Unlimited

Process data storage capacity Program Storage 999 Max

Instruction value of wire feed  $\pm 0.01 \sim \pm 9999.99 \text{mm}$

Instruction value of cam  $\pm 0.10 \sim \pm 359.90$

Servo motor of wire feed 5.5

Cam servo motor (kw) Servo motor of slide  $8 \times 1.2$

Servo motor of Quill (Z-axis) 2.7

Servo motor of Quill (Z-axis) 1.0

Servo motor of Coiling Spinner (optional) 1.0

Machine size (LxWxH) (mm)  $2400 \times 2000 \times 1900$

Weight (kg) 3500

Power 380V 3-Phase

### **Third. Operating the mechanical part**

1. The power should be connected before starting the machine, the machine should be cleaned, and no other debris should be left on the machine.
2. First turn on the power switch on the base to light up the fluorescent screen, and then turn the machine in manual mode. At this time, use a manual spray oil can to lubricate the eight sliding guides and chutes on the front panel, and then shake it for two rotations without failure until.
3. The back of the machine is the wire feeding part and the wire transfer device, and the straightener is behind the wire transfer device. The center of the straightener, the center of the pressure plate and the center of the rotating shaft have been adjusted in the same straight line before leaving the factory. The user does not need to adjust the center, if the center is misplaced, the user can adjust it by himself.
4. The measuring parts equipped with this machine include one set of

triplex, one set of single-electric two-position five-way valve, two micro-cylinders, and two probes (measurement head) for users to use when making precision springs.

5. There are eight sliding guide rails on the front panel for tool holders. The machine is equipped with 6 movable tool holders, two 45° inclined tool holders, two straight tool holders, and two template holders. They can be installed separately. On the eight sliding guide rails, the operator can select the appropriate tool holder according to various spring requirements to complete the task of processing the spring.

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

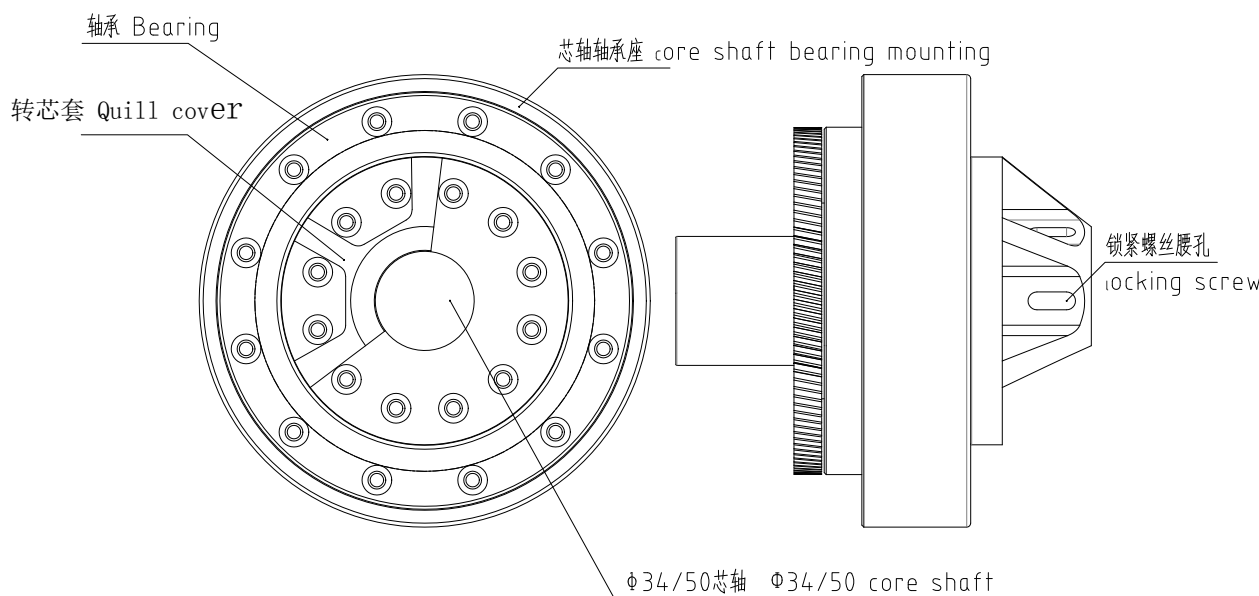


Figure (II)

7. When assembling the  $\phi 20\text{mm}$  mandrel, use the accessory mandrel

chuck, the outer diameter is  $\phi 50\text{mm}$ , and the inner hole is  $\phi 34\text{mm}$ .

8. When replacing the mandrel, refer to the figure (2). Unscrew the 2-M8 locking screw above, pull out the  $\phi 50$  or  $\phi 34$  mandrel, reinstall it, and tighten the 2 M8 screws.

9. The curve gauge and mandrel used when coiling the spring are all prepared according to the diameter of the steel wire. Each steel wire with a diameter of specification is equipped with a curve gauge and a mandrel, and the user can choose according to the requirements.

10. The principle of wire assembly: before spring unwinding, introduce the steel wire from the wire feeder into the turntable, pass through the straightener, and then pass the crimping plate (5, 7) and the crimping wheel (6, 8) from the mandrel (10) Pass to see if the wire is straightened. If the wire is bent, the spring cannot be used. It must be straightened repeatedly by the straightener until it is basically straight. But the most important thing to install steel wire is the four-center straight line, that is, the center of the straightener, the center of the crimping plate, the center of the crimping wheel, and the center of the mandrel hole. The operator can adjust the machine according to this principle. Please see the schematic diagram (3).

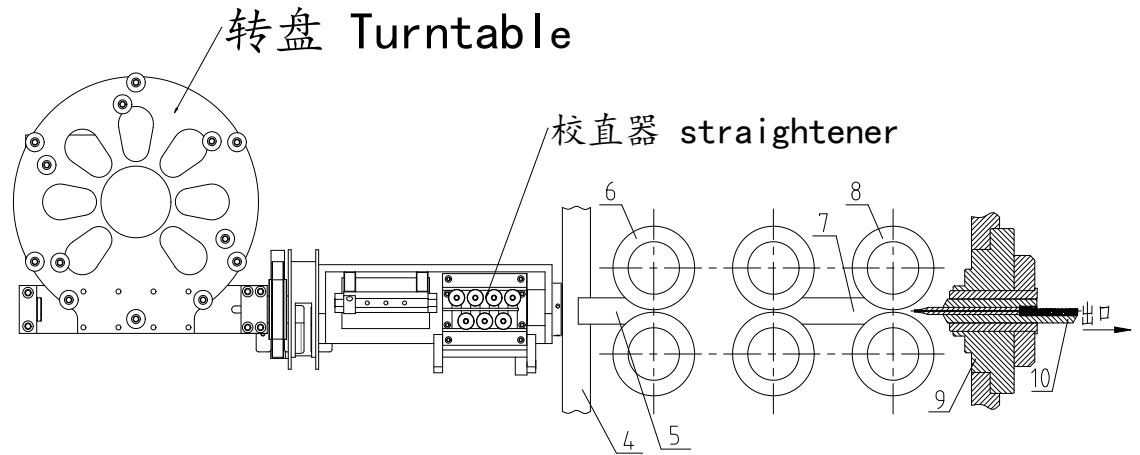


Figure (three)

11. How to adjust if the two pairs of wire feed wheels are different? Please refer to the picture (4), you can see that one end of each pair of crimping shafts is fastened with a pressure plate, first loosen the pressure plate, and buckle the rotating stud (3) with a wrench to move the wire feed shaft up and down to align the pressure line The center of the wheel groove, when the two pairs of crimping wheel groove centers are aligned, tighten the cover plate, and install the back cover after the adjustment is completed, and other parts remain unchanged.

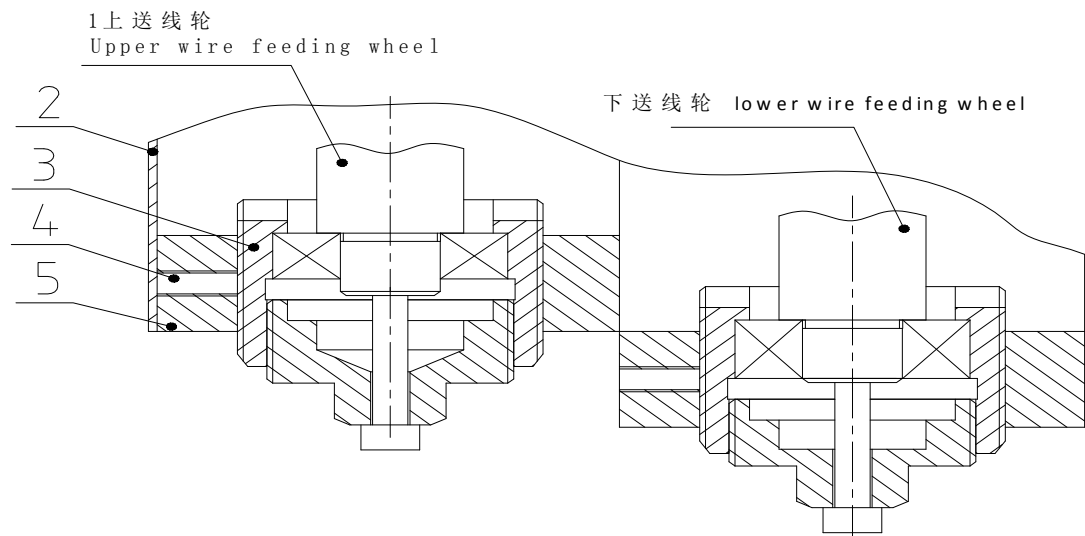


Figure (four)

12. The measuring part is also called the pneumatic part. It is set by the machine to match the length of the spring and the torsion angle of various springs. It consists of a set of triplet, two-position five-way solenoid valve and valve island. On the right side of the base, a micro-cylinder and a probe are assembled together to become a precision detector. The detector is mounted on the base panel with a meter rod, aligned with the part of the workpiece to be tested, and is controlled by a computer. The accuracy of the workpiece is controlled, but a certain number of defective products will always appear in the processing of a batch of products. In order to ensure high-quality products, the occurrence of defective products must be restricted, so a certain number of defective products are set on the

computer controller to give a limit. When the machine reaches the preset value during processing, the machine will stop automatically. You can find out the reason and deal with it to remove the fault. If there is an electrical fault, you can open the back cover of the machine base and check the (SGDM) driver's upper alarm display code, and then The following alarm display table is compared and processed.

#### **Four, safety, maintenance, repairing .**

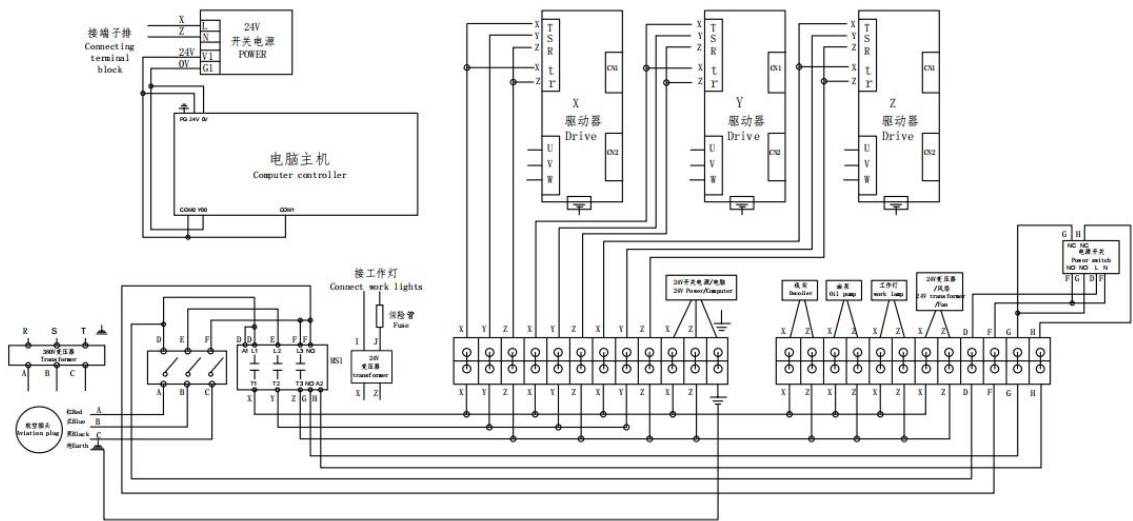
- Good maintenance is important for keeping the stable precision and prolonging the service life of the machine. So, during using the machine, the operator should oil the three shafts of the crankshaft every four hours, and oil the eight slide guides and slide ways with sprayer one to two times every day. Remember to clear the smears and dirt on or around the machine after you finish your work.
- While coiling spring, the diameter of springs is fixed according to the machine. Do not change the diameter of springs, otherwise the machine may be damaged.
- The machine has a high speed during running, so, operators are prohibited to stretch the hand into the machine or use ironware to clear the springs or other materials in the machine while the machine is on working. If there is something wrong of the machine, operators should shut off the machine at once, and then begin to remedy the faults.



- The workshop should keep clean. Do not expose the machine to the sun directly or heat something in the room. Pay attention to keep the temperature of the room within 16°-26° and keep dust out.

Wiring diagram :

永联数控弹簧机接线图  
Wiring diagram of Yonglian CNC spring machine



- 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。
- 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.