



轮毂拉丝机使用说明 Instructions for the Hub Wire-drawing Machine/ Rim Diamond Cutting Machine

一、轮毂拉丝机外接电源接线 1. The hub wire-drawing machine is externally connected to the power wiring

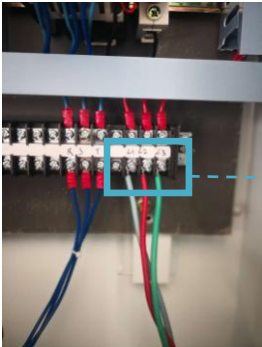
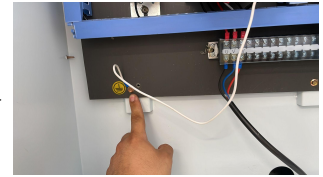


打开轮毂拉丝机后方电柜门

Open the rear cabinet door of the hub wire-drawing machine

备注：在机器背后，有一个接地图标，请按照指示将机器接地，以保障操作安全。

Remarks: There is a grounding icon on the back of the machine, please follow the instructions to connect the machine to the ground to ensure safety during operation.



380V : L1\L2\L3 端子接电源线

L1\L2\L3 terminals connected to the power cord for 380V version

220V: L\N端子接电源线

L\N terminals connected to the power cord for 220V version



采用 RVV 4mm² 三芯电缆，引入三根火线，无需零线。线路板下方有接线端子排，L1\L2\L3 无需分电源相序，三根火线随意接。

380V: RVV 4mm three-core cable is adopted and three L wires are introduced without N wires. The wiring terminal row is located below the circuit board. L1, L2, L3 do not need to divide the power phase sequence, and the three L lines can be connected without order.

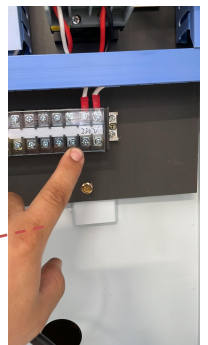
220V, L and N two cables need to be connected.

380V L1\L2\L3 端子位置

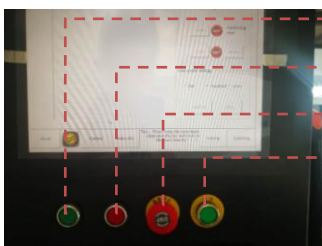
380V L1\L2\L3 terminal position

220V L\N端子位置

220V L/N terminal position



二、开关机步骤 2. Steps to start up and shut down



电源启动键 Power On Button

电源关机键 Power Off Button

紧急停止键 Emergency Stop Button

电脑开关键 Computer Power On/Off Button

开机时，只需点击电源启动键，无需点击其他按钮，电脑自动启动；



关机时，先点击电脑开关键，待电脑黑屏后再点击电源关机键；
出现紧急情况时，点击紧急停止键，让设备停止运动。

双击电脑桌面 AUTO VS1.0 进入操作系统

To power on the machine, just click the "Power On" button, and the computer will start automatically without clicking other buttons.

To switch off the machine, switch off the computer first ("Computer On/Off" Button), and then click the "Power Off" button after the screen is black. (The computer data will lost if you don't follow this step, and the machine needs to be recalibrated.)

In case of emergency, use the "Emergency Stop" button to stop the motion of the device.

Double-click AUTO VS1.0 to enter the operating system

三、手持脉冲轮操作 3. Hand-held pulse wheel operation



轴向选择旋钮 Axial selection knob:

X 对应轮毂拉丝机 X 轴 The X axis of the corresponding hub wire-drawing machine

Z 对应轮毂拉丝机 Z 轴 Corresponding to the hub of the drawing machine Z axis

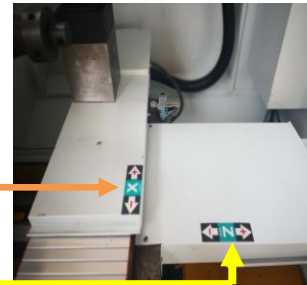
Y、4、5、6 无效 Y, 4, 5, 6 are invalid

轴移动速度倍数 Multiple of axial movement speed:

X1 为慢速 slow

X10 为快速 fast

X100 无效 invalid



四、轮毂安装 4. Wheel hub installation

第一步，根据轮毂螺丝孔数安装螺丝；

Step 1: Install the screws according to the number of hub screw holes

安装四孔轮毂时，需在主轴上安装 4 个螺丝，螺丝分布成十字型如下图；

When installing the four-hole hub, 4 screws should be installed on the main shaft, which are distributed into a cross shape as shown in the figure below



安装五孔轮毂时，只需安装三颗螺丝，如下图

When installing the five-hole hub, only three screws are needed, as shown in the figure below



第二步：安装轮毂后，螺丝拧上螺帽，螺帽只需拧上两扣，不要拧紧。如下图

Step 2: After installing the hub, screw on the nut, screw on only two buckles, do not screw tight.

The following figure



安装上中心杆与平衡锥并拧紧，然后锁紧螺帽。如下图

Install center rod and balance cone and tighten, then lock nut. The following figure



然后锁紧螺帽，拆除中心杆和平衡锥，防止轮毂加工中出现碰撞。Then lock the nut and remove the center rod and balance cone to prevent collisions in hub machining





五、轮毂数据采集 5. Data acquisition of automobile wheel hub

第一步：根据轮毂造型粘贴绝缘胶布（无 LOGO 光滑）。

Step 1: Paste insulation tape (tape without LOGO smooth) according to wheel hub shape.



胶布与轮毂密贴无气泡

Adhesive tape and hub are tightly attached without bubbles



轮毂边缘平直延伸出去，防止车削过程中出现台阶不光顺。

The rim of the hub extends straight out to prevent the machining surface from becoming unsmooth during turning

轮毂边缘胶布粘贴方法

Hub edge adhesive tape paste method

第二步：设置轮毂采集起点 **Step 2:** Set the starting point for collecting data of automobile wheel hub



先用脉冲手轮将 X 轴摇到轮毂中心附近需要拉丝的位置（可以先在起点位置做个很小的标记，方便后期对刀），再脉冲手轮轴向旋转到 Z 轴，让激光显示屏显示为 0.0xx（前两位为 0 就可以，不管正负）。

First, use the pulse handwheel to roll the X-axis to the position near the hub center that needs wire drawing (a very small mark can be made at the starting position to facilitate later knife setting), and then pulse the handwheel to rotate to the Z-axis to make the laser display display as 0.0xx (0 for the first two digits is ok, whether positive or negative).



激光安装时，LOGO 面向上，激光与轮毂面是垂直关系。

When laser is installed, the LOGO faces upward and the relationship between the laser and the hub surface is vertical

激光显示界面，显示读数从上向下读，比如现在读数为 0.005

The laser display interface shows the reading from top to bottom, such as reading 0.005 now



激光显示为±0.0xx 时点击 start, 起点设置完成
Click Start when the laser display is ±0.0xx, and the starting point setting is completed

第三步：设置终点 Step 3: Set the end point



脉冲手轮把轴向旋转到 Z 轴, 让激光向远离轮毂方向调整, 再把脉冲手轮轴向旋转到 X 轴, 让激光点超出轮毂边缘, 在电脑界面点击 END, 终点设置完成。

The pulse handwheel rotates the axis to the Z axis to adjust the laser away from the hub, and then rotates the pulse handwheel to the X axis to make the laser point beyond the hub edge. Click END on the computer interface to complete the setting of the destination

the setting of the destination



第四步：选择采集速度模式并开始采集 Step 4: Select the collection speed mode and start the collection



选择采集速度模式 Select the acquisition speed mode:

fast 快速扫描, 采集点跨距大 *Fast scanning, large collection point span.*

Standard 中速扫描, 采集点跨距较短 *Medium speed scanning, short collection point span.*

Slow 台阶扫描, 用于轮毂精细扫描, 如轮毂带立边或大圆弧 *Precision scanning, used for high-edge hub scanning, such as high-edge hub or great arc.*

点击 **start-up** 开始采集 Click "Start-up" button to start collecting data.

采集过程中如需要更换采集速度可点击 **暂停 stop**, 待机床停止运动时更换采集速度模式, 然后点 **继续** 按钮 (继续按钮就是 stop 按钮按完后显示的按钮)

If it is necessary to change the acquisition speed during the acquisition process, click "Stop" button. When the machine stops moving, change the acquisition speed mode, and then click the "Continue" button.



button (the continue button is the button displayed after the stop button is pressed).



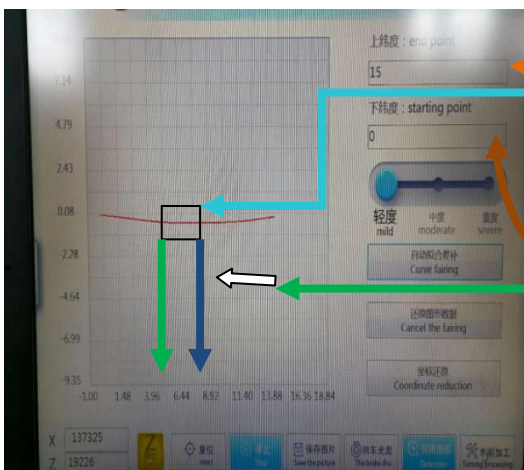
轮毂采集过程中激光点一直在胶布上（胶布密贴轮毂部位），待激光采集完，z轴会自动回退。采集过程结束。In the process of hub collection, the laser point is always on the adhesive tape (the adhesive tape is closely attached to the hub). After the laser collection, the Z-axis will automatically fall back. The acquisition process is complete.

六、进入轮毂数据界面 6. Car hub data view



数据采集完成后，点击**拟合图形 (Fairing)**键进入轮毂数据界面，After data collection is completed, click the "**Fairing**" button to enter the hub data interface

轮毂数据界面具有轮毂数据曲线放大缩小功能以及曲线平滑度调整功能。Automobile hub data interface has hub data curve zoom function and curve smoothness adjustment function



用手指轻微用力在屏幕上按住框选出想要放大的部分，这部分会自动放大。Gently press and hold the box on the screen to select the part of the screen that you want to zoom in, and this part will zoom in automatically

用手指沿白色箭头方向在曲线旁空白处滑动，图像会恢复到未放大状态。Slide your finger along the white arrow in the margin next to the curve and the image will revert to its unenlarged state

曲线平滑调整是指曲线出现不光顺或者波浪纹时进行光顺调整就能实现曲线的平滑。例如图中蓝色框选部分需要平滑调整时，只需将蓝色箭头指向的坐标数值填入**上维度 (end point)**位置中；绿色箭头指向的坐标数值填入**下维度 (starting point)**位置中。然后点击**自动拟合差补**按钮 2 或 3 次即可完成平滑调整。Curve smoothing adjustment refers to the smooth



adjustment when the curve is not smooth or wavy. For example, when the blue box selection in the figure needs smooth adjustment, the coordinate value pointed by the blue arrow can be filled into the position of the upper dimension (*end point*). The coordinate values pointed by the green arrows fill the *starting point positions*. Then click the button of *automatic fitting difference supplement* for 2 or 3 times to complete the smooth adjustment.

七、进入轮毂拉丝加工界面 7. Automobile hub wire drawing operation interface



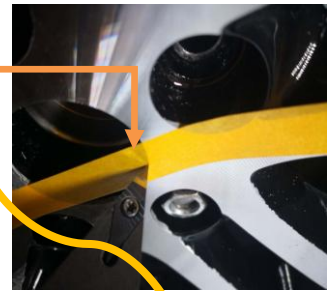
第一步:对刀 Step 1: Starting point of turning

点击轮毂数据界面中 **车削加工 (Turning processing)** 按钮进入加工界面;

Click the "Turning Processing" button in the hub data interface to enter the machining interface

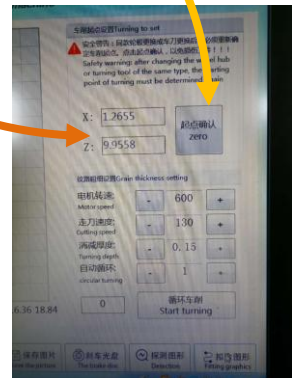
安装好刀具, 通过脉冲手轮让刀尖对齐采集时的 **起点位置 (刀尖一定要与起点位置一致)**, 然后点击屏幕中的 **起点确认 (zero)** 按钮, 刀尖位置坐标会变成 **x0.0000 z0.0000**。对刀完成;

When the cutter is installed, align the tip with the starting point (the tip must be always at the starting point). Then click the Starting Point button on the screen and the coordinate of the tip will change to X0.0000 z0.0000. The knife to complete



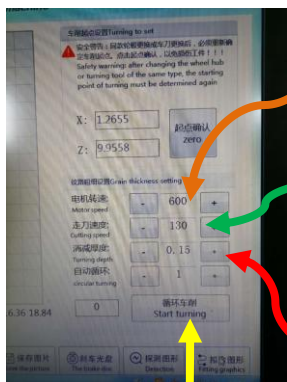
When the cutter is installed, align the tip with the starting point (the tip must be always at the starting point). Then click the Starting Point button on the screen and the coordinate of the tip will change to X0.0000 z0.0000. The knife to complete

轮毂拉丝加工界面
Automobile hub wire drawing



repair interface

第二步, 调节加工数据 Step 2: Adjust the surface drawing data



电机转速 (Motor revolutions) 主轴转速 (轮毂每分钟转多少圈) 一般设为 300 或 350, 按 +/- 号调节。

The spindle speed (how many revolutions per minute the hub makes) is generally set at 300 or 350, which is adjusted by +/-

走刀速度 (Feeding speed) 通过改变车削速度可改变轮毂拉丝纹路粗细, 一般常用为 100-150。

Feeding speed : The width of hub texture can be changed by changing the cutting speed, which is usually 100-150

消减厚度 车刀车削时的深度, 数值越大车削下的料越多。此数值无需每次更改, 电脑自动累计, 此项数值为多少机床就会车削多少厚度。一般加工第一遍设置为 0, 第二遍根据刀尖车削深浅调整大小可为 0.15-0.05 之间, 当轮毂整个平面都基本车削到时, 改精车数值为 0.04。

Reducing thickness is the depth of turning tool processing, this value does not need to be

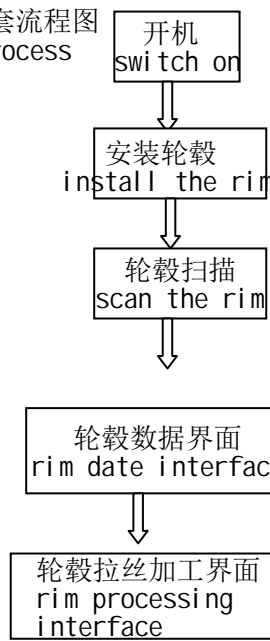


changed every time, the computer automatically accumulates, the numerical machine tool will turn the corresponding thickness. Generally, the first time of machining is set as 0, and the second time can be adjusted as 0.15-0.05 according to the turning depth of the tool tip. When the entire plane of the hub is basically turning, the value of finishing turning is 0.04.

循环车削 (circular turning) 按钮 上面三个数据调整好后点击此按钮开始加工, 如果 **消减厚度** 无需更改得话点击此按钮就行。

"Circular Turning" Button: Click this button to start processing after the above three data are adjusted. Click this button if there is no need to change the thickness reduction.

小结: 整套流程图
Whole process



只需点击电源启动键Switch on the machine by click the "Power On" button only

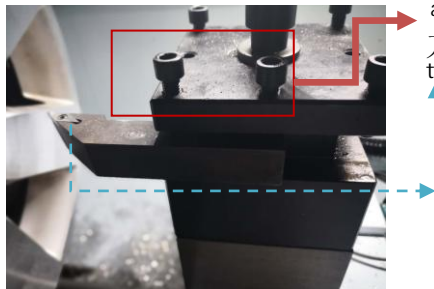
根据轮毂螺丝孔安装螺丝Install the rims

通过脉冲手轮操作激光点位置和读数来设置起点 (需要拉丝的起始位置) 读数为±0.0xx, 终点设置方法同起点一样。选择扫描模式, 点击 start-up 开始采集。Set the starting point (the starting position for wire drawing) reading to ± 0.0xx by operating the laser point position and reading with the pulse handwheel. The end point setting method is the same as the starting point. Select the scan mode and click "start-up" to start the acquisition.

扫描完成后点击扫描界面下方 **Fairing** 键进入轮毂数据界面, 可以观察曲线, 也可在需要修改曲线时调整曲线平滑度。After scanning, click the "Fairing" button at the bottom of the scanning interface to enter the hub data interface. You can observe the curve and adjust the curve smoothness when you need to modify the curve.

点击轮毂数据界面右下方 **Machining** 按钮进入加工界面先对刀, 再调整参数, 然后开始加工。Click the Machining button at the lower right of the hub data interface to enter the processing interface. First, set the tool, then adjust the parameters, and then start processing.

刀具安装方式Install the cutter:



刀具安装时至少有两颗螺丝锁紧。At least two screws shall be locked when the tool is installed.

安装有刀片的面向上The blade should be installed facing up.

激光仪安装方法: 激光仪需要垂直轮毂面, **LOGO**面向上 两颗螺丝锁紧即可。

Installation method of laser instrument: the laser instrument needs to be vertical to the hub surface, with the LOGO facing upwards, and two screws can be locked tightly.

