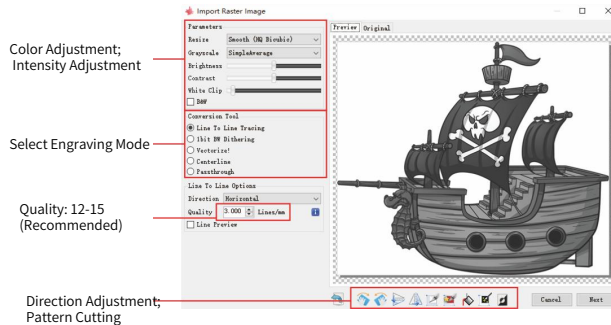


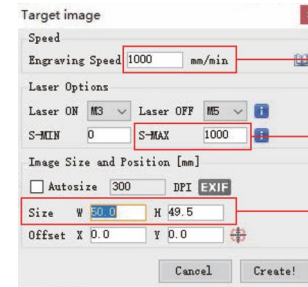
5. Set image parameters, engraving mode, and engraving quality

1. LaserGRBL allows you to adjust the sharpness, brightness, contrast, highlights, and other attributes of the target image. We can preview the effect in the preview window during the adjustment process and fine-tune it to your satisfaction.
2. In engraving mode, you typically have the options to choose "Line To Line Tracing" and "1bit Bw Dithering"; "1bit Bw Dithering" is more suitable for engraving grayscale images. If cutting is required, select "Vectorize!" or "Centerline".
3. The engraving line width primarily refers to the width of the line scanned by the laser. This parameter mainly depends on the size of the laser beam spot of the engraving machine. Note: It is recommended that the engraving quality range be 12-15. Different materials react differently to laser exposure, so the specific value depends on the particular engraving material.
4. At the bottom of the preview window, you can also perform operations such as rotating, mirroring, and cutting the image. After completing the above settings, click 'Next' to proceed to the settings for engraving speed, engraving power, and engraving dimensions.



6. Set engraving speed, engraving power, and engraving dimensions

1. The recommended engraving speed is 1000, which is considered a relatively appropriate value after repeated experiments. Of course, you can also increase or decrease this speed according to your preferences. A faster engraving speed will save time but may result in reduced engraving quality.
2. In laser mode, there are two commands: M3 and M4. If your laser only has the M3 command, please check if this laser mode is configured for GRBL. For information on GRBL configuration, please refer to the official documentation of LaserGRBL.
3. Select engraving power. Choose based on different materials.
4. Finally, set the dimensions and click the 'Create' button to complete the setup of all engraving parameters.



Save Gcode File

Click on "File" in the top menu of the software interface to access the drop-down menu, then select "Save." Copy the saved .nc file to a TF card, insert the TF card into the engraving machine, and you can use this file to engrave your work. You can use the "MKS LaserTool" software on the TF card to add preview code to the Gcode file. .

6. Software Parameter Settings

EN

To address the distortion of patterns when engraving irregular-shaped cups with varying diameters, dynamic compensation algorithms must be used to achieve precise machining. The specific implementation steps are as follows:

1. Calculate the diameter at the midpoint of the cup body. Use the flexible tape measure from the tool kit to measure the circumference of the cup. Based on the circumference formula $C = \pi d$ (A.06), you can deduce the diameter of the cup body, or you can measure it directly using a vernier caliper

2. Pulse value calculation formula: $200(\text{Motor pulse value}) \times 16(\text{Drive Subdivision}) \times 4(\text{subtrahend ratio}) / \text{Circumference of circular object}$
(Motor pulse value: 200, Drive Subdivision : 16, subtrahend ratio: 4 are all fixed values. You only need to calculate the circumference of the cylinder.)
(Example: When the cylinder diameter is 50mm, using the circumference formula $C = \pi d$, we calculate $C = 3.14 \times 50\text{mm}$, which gives 157mm.)

$$(200 \times 16 \times 3) \div 157 \approx 81.53 \text{ Pulses /mm}$$

Circular object circumference

3. Adjust the motor pulse parameters of the chuck/roller axis through the software to maintain a constant linear velocity of the engraving vector along the circular development surface, ensuring the pattern is proportionally restored on the conical surface.

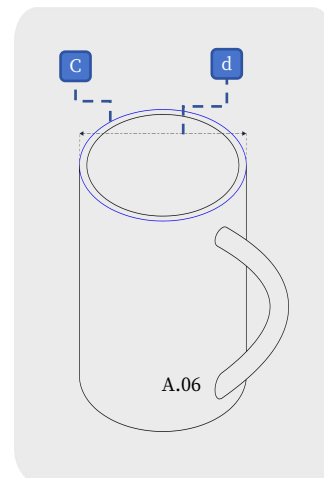
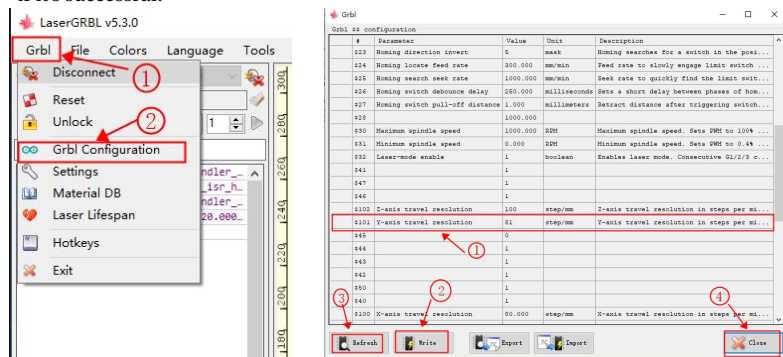
6.1 GRBL Software Pulse Settings Tutorial

Step 1: Connect the machine.

Step 2: Locate Grbl in the top left corner of the software and click on Grbl settings again.

Step 3: In the Grbl settings table, find \$101 and enter the calculated pulse value.

Step 4: Make sure to click 'Write' after finishing the modification of parameters. Update to check if it's successful.



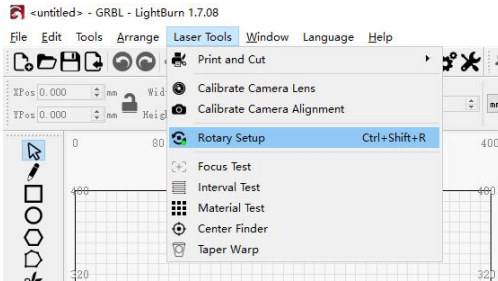
6.2 LightBurn Software Pulse Settings Tutorial

1. Chuck Mode

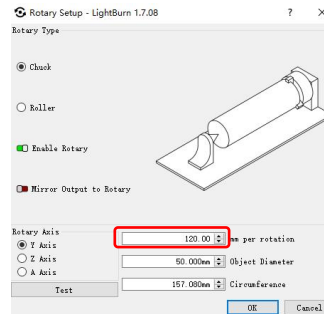
Open the software and connect the machine. In the software control interface, go to "Laser Tools" (A.05), then proceed to the rotary axis settings (as shown in the figure below), select the chuck mode (A.06), and enable the rotation function. It is recommended to set the Y-axis rotation speed to 120mm/revolution. Use the flexible tape measure from the tool kit to measure the circumference of the cup, and then enter either the circumference or the diameter.

2. Roller Mode

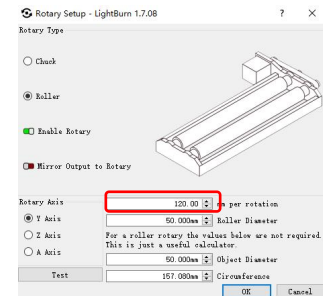
Open the software and connect the machine. In the software control interface, go to "Laser Tools" (A.05), then proceed to the rotary axis settings (as shown in the figure below), select the roller mode (A.07), and enable the rotation function. Use the flexible tape measure from the tool kit to measure the circumference of the cup, and then enter either the circumference or the diameter. It is recommended to adjust the rotation speed according to actual conditions after testing. The diameter of the machine's roller is 37mm.



A.05



A.06



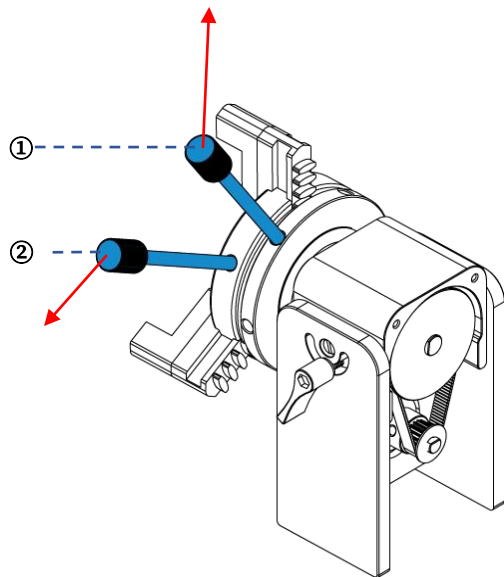
A.07

7. Operation Guide

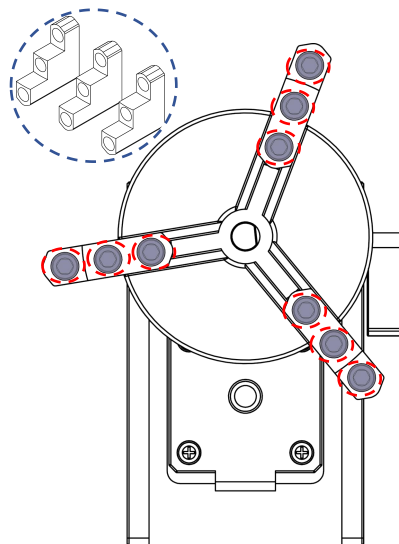
EN

7.1 Instructions for Using Chuck Mode

1. When clamping an object, use the "chuck wrench" ① to rotate counterclockwise to adjust the position. ② rotate clockwise to tighten the grip on the object. To release the object, rotate the wrench in the opposite direction.

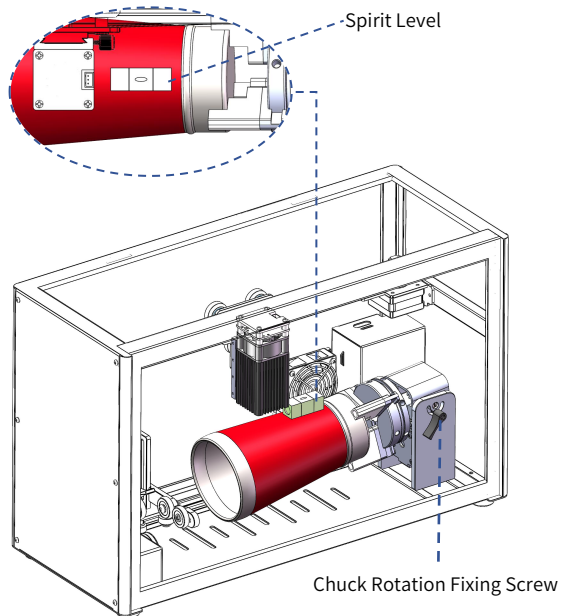


2. When clamping small-sized cups, you can remove the marked screw and replace the large chuck jaws with step chuck jaws.



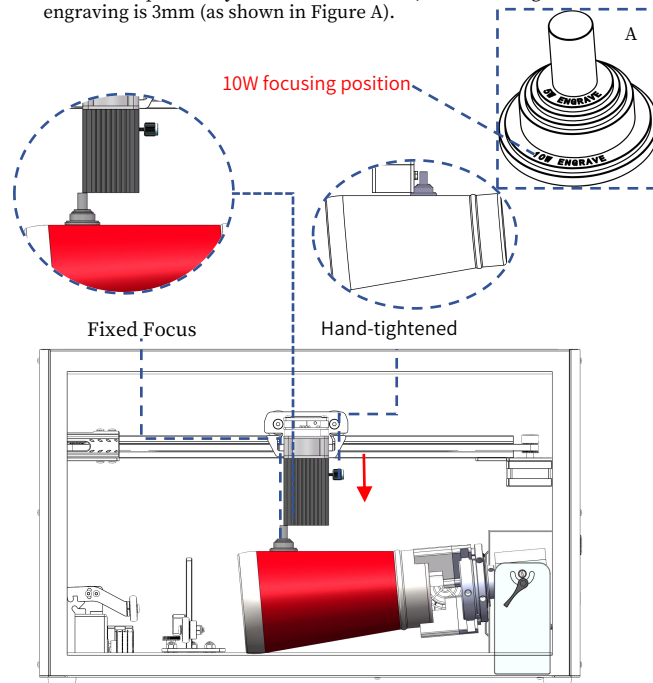
7.2 User Tutorial

1. After clamping the cup with the chuck, place the level on the upper surface of the cup, adjust to keep the upper surface of the cup horizontal, and then tighten the "chuck rotation fixing screws" to ensure the chuck remains stable and free of wobble during operation.



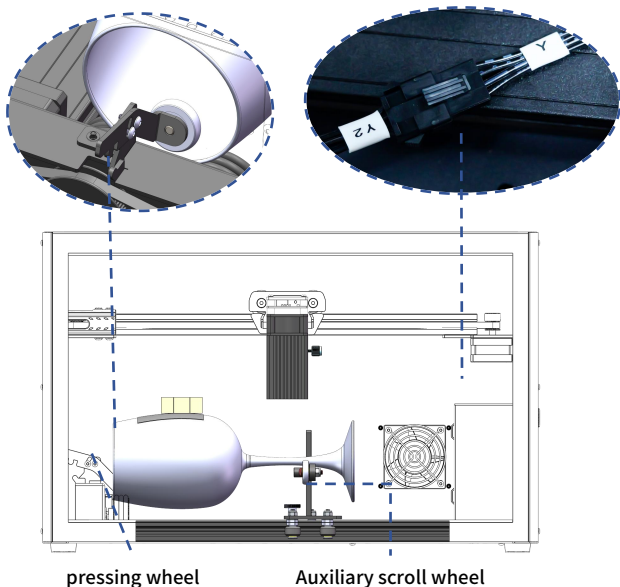
2. Place the "Fixed Focus" on the surface of the object, then lower the laser module so that it is directly above the Fixed Focus, and finally tighten the hand-tightened screws. At this point, the laser focal distance should be 23mm.

3. When the power of your laser head is 10W, the focal length for engraving is 3mm (as shown in Figure A).



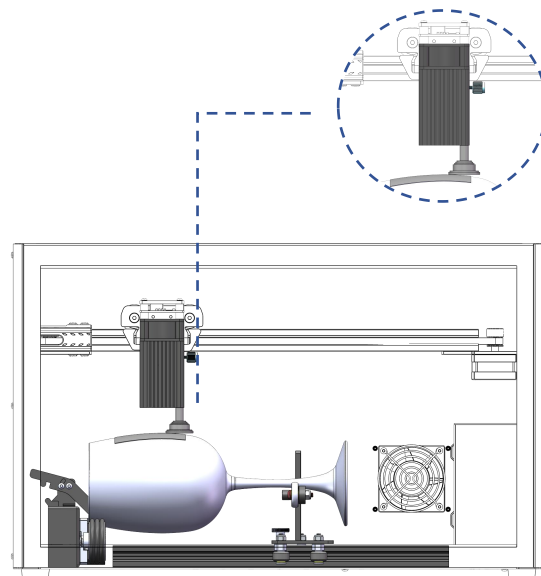
7.3 The method of using the scroll wheel mode

1. Place the rim of the wine glass on the scroll wheel, secure the rim with the pressing wheel, adjust the height of the auxiliary scroll wheel so that the stem of the glass rests on the wheel.
2. Switch the motor wires: First, disconnect the Y1 motor wire from the Y motor terminal, then connect the Y2 motor wire to the Y motor terminal.
3. Place the level on the upper surface of the wine glass to ensure that the upper surface of the wine glass remains horizontal.



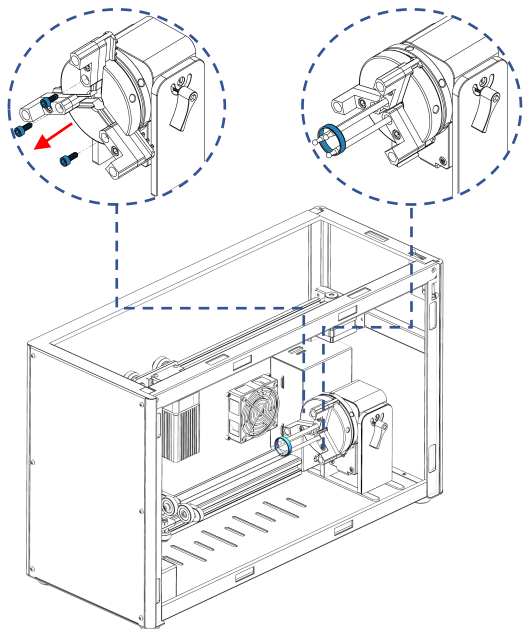
2. Place the “Fixed Focus” on the surface of the object, lower the laser module so that it is directly above the Fixed Focus, and tighten the hand-tightened screw. At this point, the laser focal length should be 23mm.

Note: Since transparent glass has a high light transmittance, you need to attach dark-colored paper to it before engraving.



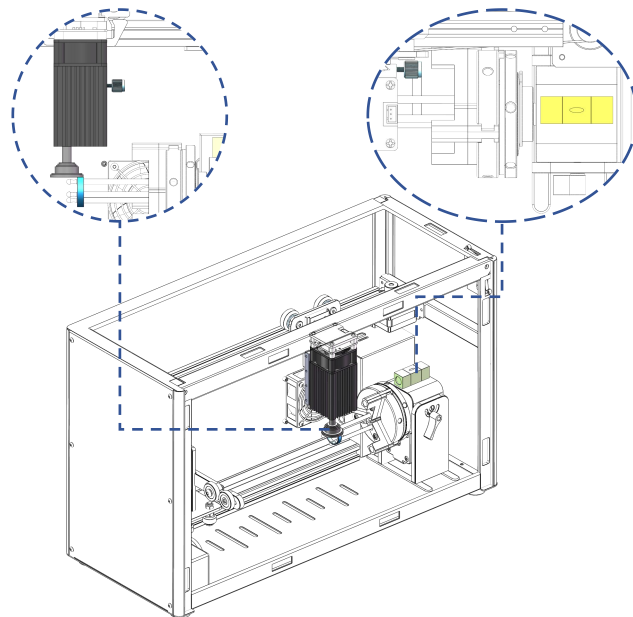
7.4 Tutorial for Engraving Ring-shaped Objects

1. Remove the three screws that fix the chuck jaws, and then install the inner support shafts (3 pieces). When clamping, use the inner support shafts to hold the inside of the ring-shaped object and tighten the chuck with a chuck wrench.



2. Place the “Fixed Focus” on the surface of the object, lower the laser module so that it is directly above the Fixed Focus, and tighten the hand-tightened screw. At this point, the laser focal length should be 23mm.

3. Place the level steadily on the surface of the chuck seat. Adjust the base support screws or rotate the chuck angle to center the bubble in the level, ensuring that the entire chuck seat is in a horizontal state.



Question 1: Unable to recognize files in the TF card, how to handle it?

- 1、 Please only store the required engraving files on the TF card. Having too many files on the TF card can cause the control board to be unable to search them all, and large-capacity files should be moved to the computer for storage.
- 2、 The file formats stored on the TF card are incorrect; the machine only recognizes files with the extensions .gc and .nc. The filename can only recognize numbers and letters, and cannot recognize special characters.
- 3、 The TF card may need to be reformatted due to excessive insertions and removals.

Question 2: When connecting via USB, there is a failure to connect. How should this be handled?

- 1、 The voltage of the computer port may be insufficient; try plugging the USB connection cable into a different computer port.
- 2、 Software conflicts, caused by running multiple control software applications that occupy the ports, should be resolved by closing the conflicting software or restarting the computer or the machine.

Question 3: The chuck does not grip the object tightly, how to handle it?

- 1、 Attach velvet cloth to the object's clamping area to increase friction.

9. Precautions

9.1 Safety Precautions :

- 9.1.1 The equipment and power components should be installed in an environment with good ventilation to ensure unobstructed air circulation and prevent overheating and premature aging of components.
- 9.1.2 It is strictly forbidden to reach body parts or foreign objects into the processing chamber while the equipment is operating, and the laser module's emission port must be kept in a safe isolation state.
- 9.1.3 Only use original power components that have been CE/FCC certified, and conduct monthly inspections for the integrity of cable insulation and checks for oxidation of connectors.
- 9.1.4 Ensure that the engraving machine is stably placed on a flat surface to avoid vibration or shaking.
- 9.1.5 A 1.5-meter radius around the equipment should be designated as a no-entry zone for children. During unattended periods, perform the "double cut-off" operation (power off, disconnection).
- 9.1.6 To ensure safety, manual monitoring must be maintained throughout the laser processing cycle.
- 9.1.7 During operation, the protective top cover and front door must be closed. Do not directly observe the laser with your eyes. If you need to open the door to adjust the machine, please wear laser safety goggles to protect your eyes.

9. Precautions

9.2 Maintenance and Care :

- 9.2.1 Clean the engraving machine: Use an air can or air blower to gently remove dust and debris from surfaces such as the grooves in the profiles and the belts.
- 9.2.2 Avoid using water or a damp cloth to clean the laser head to prevent damage to electronic components.
- 9.2.3 Clean the laser module lens: To clean the lens of the laser module, you can use a cotton swab dipped in a little alcohol to wipe it.
- 9.2.4 Inspect the belts: Regularly check the tightness and wear condition of the belts.
- 9.2.5 Clean the motherboard's cooling fan: Inspect and clean the cooling fan of the motherboard to maintain proper heat dissipation and ventilation.
- 9.2.6 Update firmware and software: If the machine exhibits abnormal movement or laser output. Updating can resolve the majority of potential issues.
- 9.2.7 Maintain a clean working environment: Ensure that the area around the engraving machine is tidy to prevent dust and debris from entering the interior of the motherboard and contaminating the laser head lens.

9.3 Environmental Protection Precautions :

- 9.3.1 Pay attention to indoor ventilation: When engraving, open doors and windows, and arrange ventilation pipes properly. The exhaust outlet should be placed outdoors, away from areas where people are active.
- 9.3.2 Energy efficiency: Ensure that the engraving machine's power is completely turned off when not in use to avoid unnecessary energy consumption.

10. Product Parameters

Model : TS5	Electrical Requirements : 24V DC/5A
Machine Dimensions :480*280*285mm	Laser Power :7000mW
Machine weight : 9.13kg	File Formats : NC,BMP,JPG,PNG,GCODE,ETC
Maximum Engraving Size : 249*123*123mm	Engraving Software : LaserGRBL (Windows), Lightburn (Common)
Chuck Outer Clamping Size Range : Diameter 26-140mm	Power Supply Type: US/EU Plug (optional)
Chuck Inner Clamping Size Range : Diameter 15-110mm	Software Supported Languages: Chinese/English/ Italian/French/German
Laser Wavelength :445±5 nm	Support system :Windows ,Mac
Engraving Precision : 0.1mm	Operating Environment: Temperature 5-40°C, Humidity 20-60% RH
Main Body Material: Aluminum + Steel	Engraving Method: USB connection to PC, TF card (APP, web control)

An unsere Kunden

Sehr geehrter Kunde:

Um Ihnen ein reibungsloses Zusammenbau- und Nutzungserlebnis zu ermöglichen, haben wir dieses Montageanleitungs- und Benutzerhandbuch erstellt. Bitte lesen Sie die folgenden Inhalte sorgfältig durch und befolgen Sie deren Anweisungen, um bei der Verwendung des Produkts Sicherheit und ein reibungsloses Arbeiten zu gewährleisten. Sollten bei der Anwendung Probleme auftreten, können Sie den QR-Code scannen, um unsere Firmenwebsite zu besuchen oder über die Informationen auf dem USB-Laufwerk auf relevante Anleitungsvideos zuzugreifen. Im Falle eines Maschinenfehlers beziehen Sie sich bitte auf die Namen der entsprechenden Teile innerhalb der Maschine und teilen Sie uns das Auftreten und den Zustand der Maschine per Nachricht auf der unten angegebenen Service-E-Mail mit.



Service-E-Mail: service@twotrees3d.com
Anfrage-Mail: info@twotrees3d.com

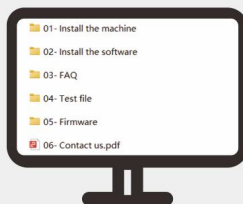
Wikipedia: wiki.twotrees3d.com

Informations-Webseite



Besuchen Sie www.twotrees3d.com um die spezifischen Modellinformationen und Geräteanleitungen zu finden.

Informationswebseite



Finden Sie das USB-Laufwerk im Werkzeugkit



INHALTSVERZEICHNIS

1. Teileliste	01
2. Entpackungsvorgang	02
3. Maschinenmontage	03
4. Maschinen- und Schnittstellendefinitionen	05
5. Geräteanleitung und Software-Schnittstellen-Handbuch	06
6. Softwareparametereinstellungen	09
7. Bedienungsanleitung	11
8. FAQ	15
9. Vorsichtsmaßnahmen	16
10. Parameter der Maschine	18