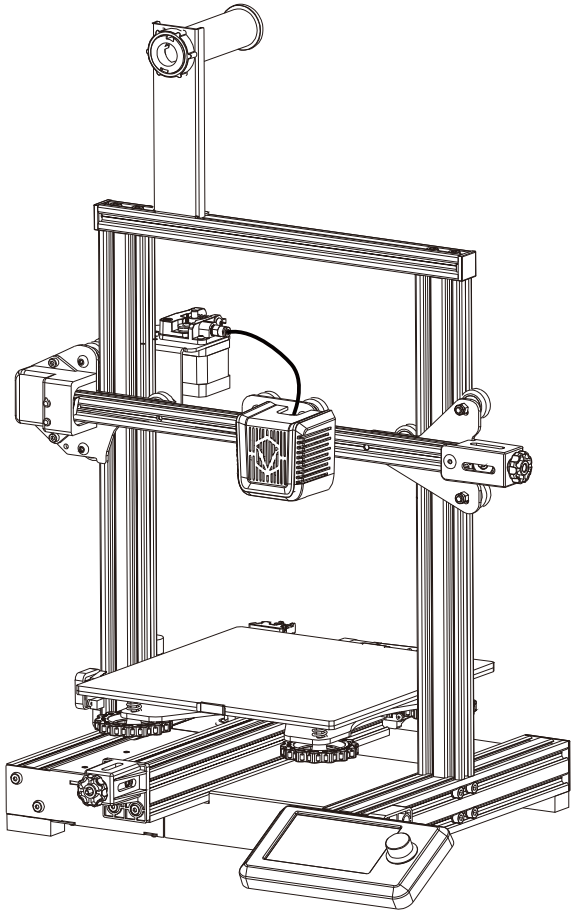


Voxelab

3D Printer User Manual

Aquila

Note: Each device must be tested before leaving factory. If there are some residues in extruder or some tiny scratches on the build plate, it is normal and won't affect the printing quality.

V1.3.6-20210531

Content

Thank you for choosing and using the products of Voxelab Technology. For your convenience, please read this manual carefully before use and follow the manual strictly. The Voxelab team is always ready to provide you with the perfect service. Please contact us by email listed, if you have any problems.

Email: support@voxelab3dp.com

You can also get operational knowledge of the equipment from the following way:

Voxelab website: www.voxelab3dp.com

Users can get the software, firmware, device maintenance and relevant contact information via Voxelab website.

A **Notes**

Product Introduction

Spare Parts

B **How to assemble Aquila**

C **Use The 3D Printer**

Start Printing

Wire connection

Printing Notice

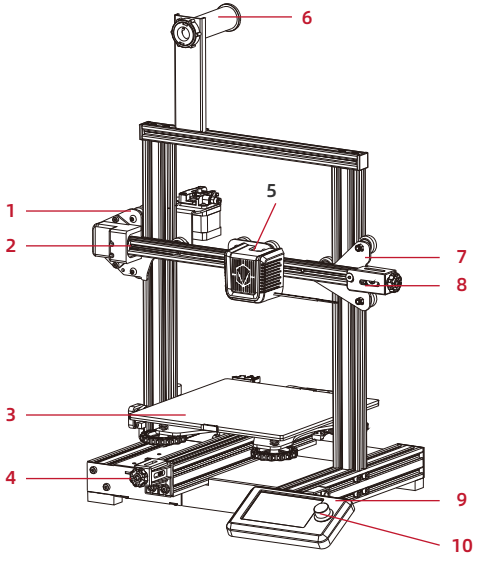
Trouble Shooting

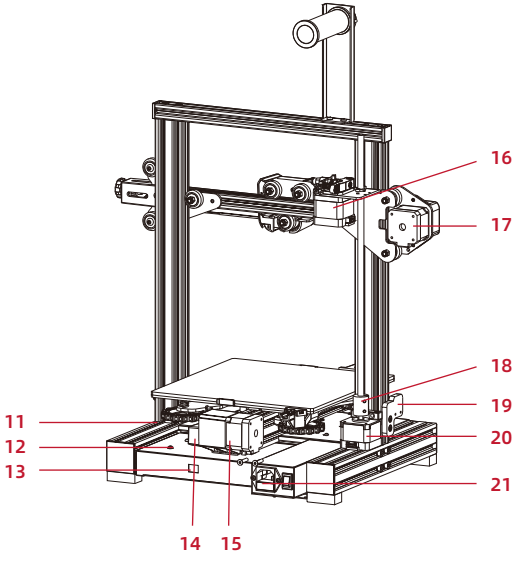
Notes

1. Do not make any modifications to the device. To avoid personal injury or property damage please ensure your operation as followed as the Guide.
2. Dress properly. Do not wear loose clothing or jewelry. Keeping your hair, clothing and gloves away from moving parts.
3. Do not directly touch the nozzle and build plate to avoid high-temperature burn.
4. Do not operate the Aquila in flammable liquid, gas or dust environment (The high temperature generated by Aquila operation may react with dust, liquid, and flammable gas in the air to cause a fire.)
5. Do not put the Aquila into the situation in which an unstable environment. The printer quality will be affected.
6. Children and untrained personnel are not allowed to operate the Aquila alone.
7. Operate the device in a well-ventilated environment. Some materials may produce odors during the printing process.
8. Do not manually move the nozzle and printing platform mechanism while booting up, otherwise the device will be damaged.
9. Never use the device for illegal activities.
10. Never use the device to make any food storage vessels.
11. Never put the model into your mouth.
12. To lower the build plate before loading/unloading filament. The distance between the nozzle and build plate should be kept for at least 50mm.
13. Keep the device with regular maintenance, to wipe with a dry cloth to remove dust and adhered printing items.

Please pay attention to the sharp edges and corners of the profile.

Product Introduction



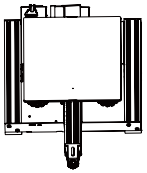


1. XE-axis kit
2. X-axis limit switch
3. Build plate
4. Y-axis tensioner
5. Extruded kit
6. Material rack and spool holder
7. Z-axis passive block
8. X-axis tensioner
9. Screen
10. Knob switch
11. Machine base
12. Power supply
13. Voltage regulator
14. Y-axis limit switch
15. Y-axis motor
16. E-axis motor
17. X-axis motor
18. Coupling
19. Z-axis limit switch
20. Z-axis motor
21. Power switch and socket

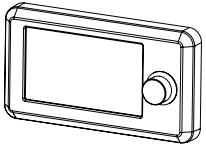
Equipment Parameters

Model	Voxelab Aquila
Print size	220*220*250mm
Forming technology	FDM
Number of nozzle	1
Layer thickness	0.1mm - 0.4mm
Nozzle diameter	Standard 0.4mm
XY axis precision	±0.2mm
Filament	ϕ1.75mm PLA
File format	STL / OBJ / AMF
Working mode	Memory card offline printing or online printing
Compatible slicing software	Cura / Simplify 3D / VoxelMaker
Power specification	Input：AC 115/230V 50/60Hz　Output：DC 24V
Total power	350W
Hotbed temperature	≤100℃
Nozzle temperature	≤250℃
Resume printing function	Yes
Filament sensor	No
Dual z-axis screws	No
Language switch	English / Chinese
Computer operating system	Windows 7/10 / Mac OS
Print speed	≤180mm/s，30-60mm/s normally

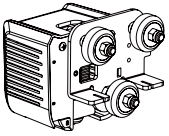
Spare Parts



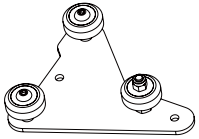
Printer base *1



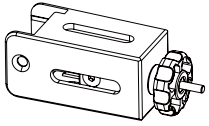
Screen kit *1



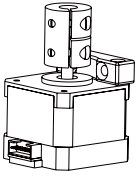
Extruder kit *1



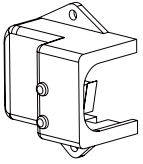
Z-axis passive block *1



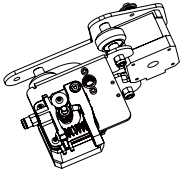
X-axis tensioner *1



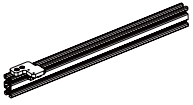
Z-axis motor kit *1



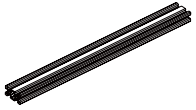
X-axis limit switch kit *1



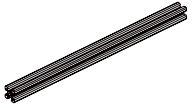
XE axis kit *1



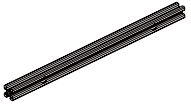
Z-axis profile(left) *1



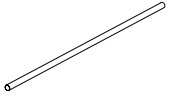
Z-axis profile(right) *1



Gantry profile *1

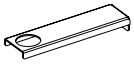


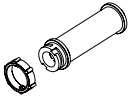
X-axis profile *1

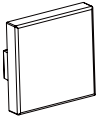


T-shaped screw rod *1

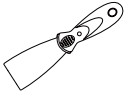
Spare Parts


Material rack *1


Material pipe and nut *1


2020 profile cover *2

Synchronous belt *1


Remove tool *1

Cable tie *1

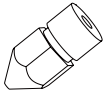
Needle *1

Storage card and card reader *1

M6 Pneumatic joint *2

Power cable *1

Wrenches and screwdrivers *1

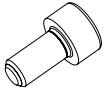

Nozzle *1

Screen bracket *1

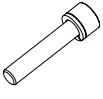
Hexagon socket countersunk head screw M4x20 *2

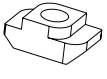
Hexagon socket flat round head screw M4x6 *2

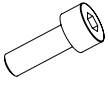
Hexagon socket flat round head screw M5x14 *6


Hexagon socket head spring washer combination screw M4x8 *2

Hexagon socket head spring washer combination screw M5x45 *5


Hexagon socket head spring washer combination screw M5x25 *5

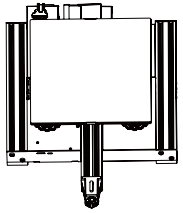

M4 T nuts *6


Hexagon socket head spring washer combination screw M4x12 *4

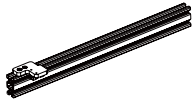
Filament *1

1 Installation of Z-axis limit switch kit and Z-axis profiles

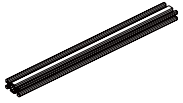
Installation video can be found on Voxelab Youtube channel



Printer base *1

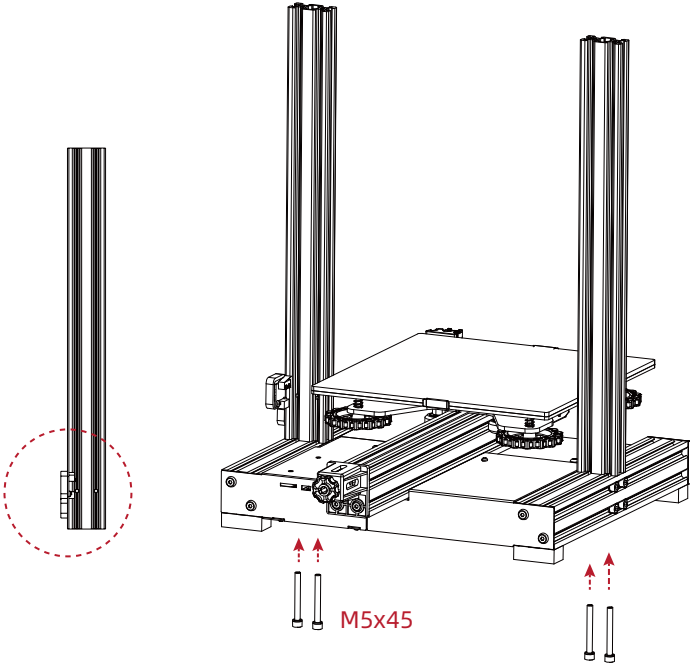


Z-axis profile(left) *1



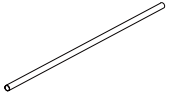
Z-axis profile(right) *1

Hexagon socket head spring washer combination screw M5x45 *4

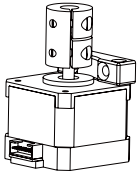


Step: Use the four pieces screws M5x45 to fix Z-axis with the base.

2 Install Z-axis motor kit and T-shaped screw rod

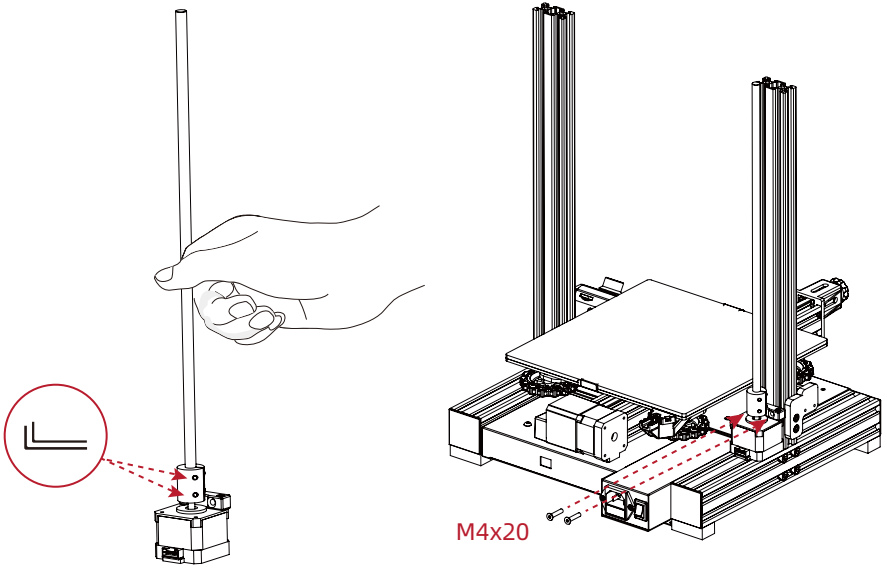


T-shaped screw rod *1



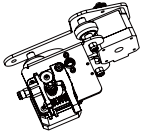
Z-axis motor kit *1

Hexagon socket countersunk head screw M4x20 *2



Step: Lock the T-shaped screw rod on the Z-axis motor component, and then use two M4x20 screws to slightly lock the Z-axis motor component on the profile (as showed above).

3 Install pneumatic joint, XE-axis kit



XE axis kit *1

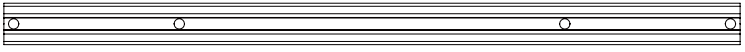
X-axis profile *1

M6 Pneumatic joint *1

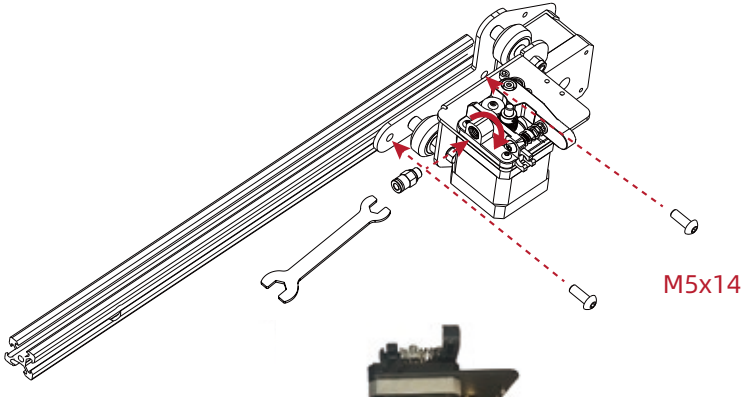
Hexagon socket flat round head screw M5x14 *2

Open-end wrench *1

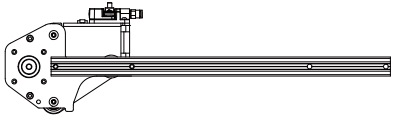
X-axis profile



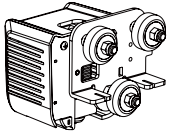
Tighten the tube connector by opening end wrench. And fix the XE-axis kit with two pieces M5x14 screws.



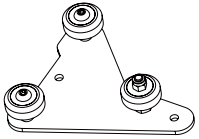
4 Install synchronous belt, extruder kit and Z-axis passive block



X axis kit

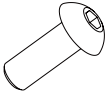


Extruder kit *1



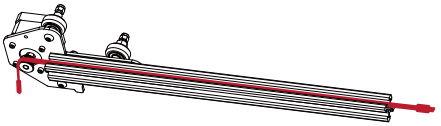
Z-axis passive block *1

Synchronous belt *1

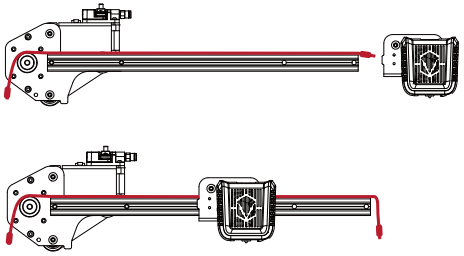


Hexagon socket flat round head screw M5x14 *1

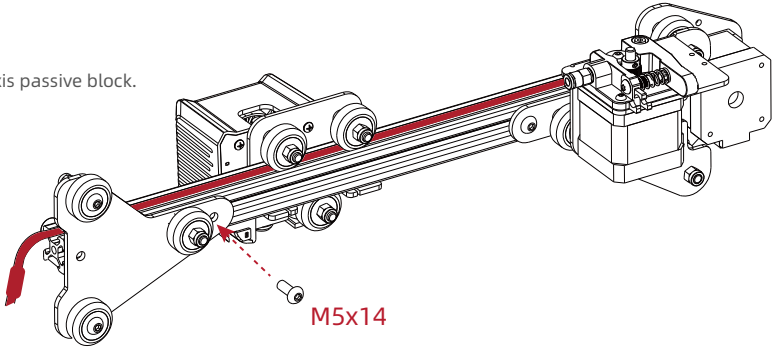
Put the synchronous belt into the profile along the v-wheel of the extruder kit.
(The belt is on the top of the profile and under the v wheel) When pushing it into the middle.



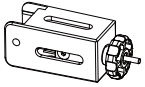
The highlighted red stripe refers to synchronous belt.



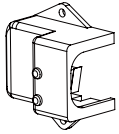
Install Z-axis passive block.



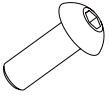
5 Install X-axis Tensioner



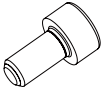
X-axis tensioner *1



X-axis limit switch kit *1

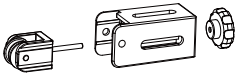


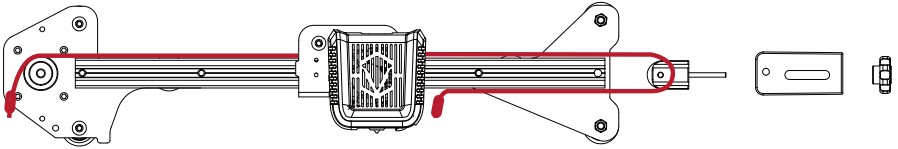
Hexagon socket flat round head screw M5x14 *2



Hexagon socket head spring washer combination screw M4x8 *2

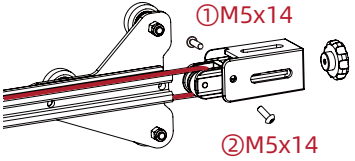
1. Disassemble the X-axis tensioner.





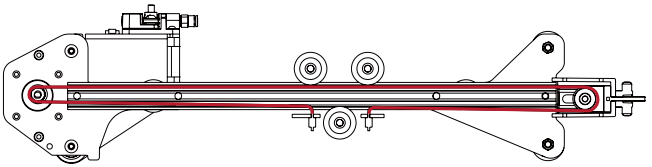
2. Insert the synchronous belt into the tensioner block, and put it into the X-axis tensioner together with the synchronous belt.

3. Tighten it with a plastic hand screw nut, lock Z-axis passive block with ①M5x14 screw first, and then lock the ②M5x14 screw.



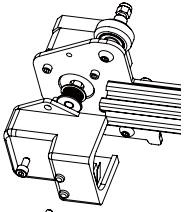
Attention: During the current operation, please do not tighten the X-axis tensioner screws with too much force.

Install X-axis Tensioner



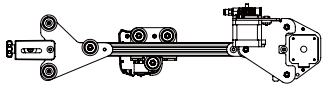
4. Insert the synchronous belt buckle into the sheet metal slot at the back of the extruder and tighten X-axis tensioner completely.

5. Lock the X-axis limit assembly on the XE axis with two M4x8 hexagon socket head cap screws.

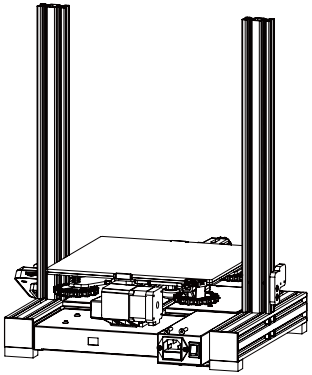


M4x8

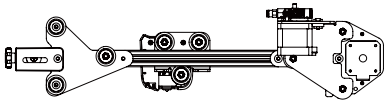
6 Install the Z-axis moving kit and adjust the tightness of X-axis and Y-axis tensioners



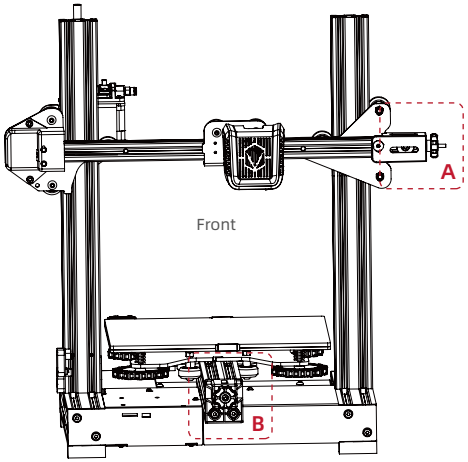
Take the first step: assembled components



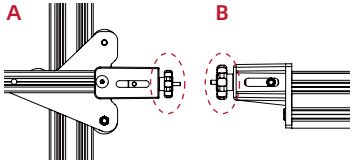
Take the second step: assembled components



Back



Front



Tips: Manually rotate the X-axis and Y-axis tensioners to be the approprate tightness. Refer to A and B: the difference between the nut and the screw (protrusion) is 0-2mm. The reference standard is to press the synchronous belt will a little tension. Too loose or tight belt will affect the printing effect, and too tight belt will break.

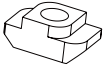
Step:

1. Make the Z-axis kit move along the V-wheel to be inserted into the two ends of the Z-axis profile (as showed in the figure above).
2. After installation, move the extruder left and right and check the tension of timing belt. It is better that the extruder can touch the X-axis sensor and the timing belt has elasticity.

7 Install the gantry profile, screen kit

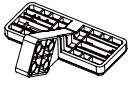
Gantry profile *1

Hexagon socket head spring washer combination screw M5x25 *4

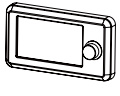


M4 T nuts *6

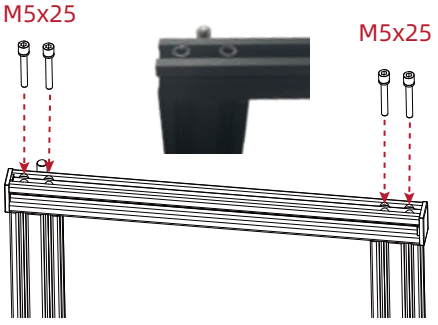
Hexagon socket head spring washer combination screw M4x12 *4



Screen bracket *1

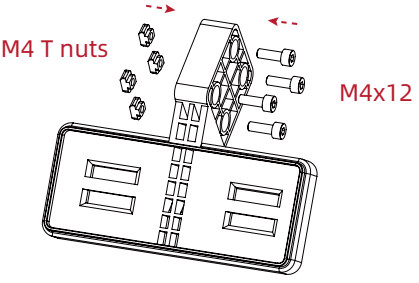


Screen kit *1

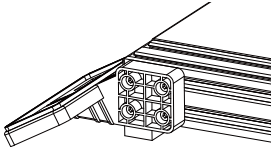


1. Fix the profile on the upper end of the gantry with four hexagon sock head cap screws M5x25.

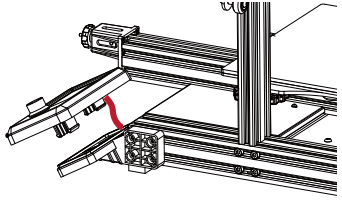
Note: Make the counterbores within the profile face upwards. Four cap screws are slotted in the counterbores, Please tighten the screws down to the profile edge.



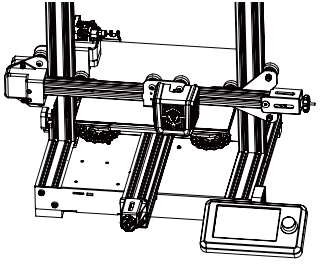
2. Tighten lightly the M4 T-nut and the M4-12 screw in turn by hexagon wrench, for a total of 4 sets.



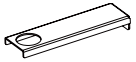
3. Use the hexagon wrench to lock the four screws on the left side of the screen bracket with the machine.



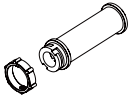
4. Connect the display screen kit with screen cable.Buckle the screen kit directly into the screen bracket.



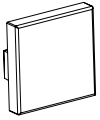
8 Install spool holder and gantry cover



Material rack *1

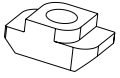


Material pipe and nut *1

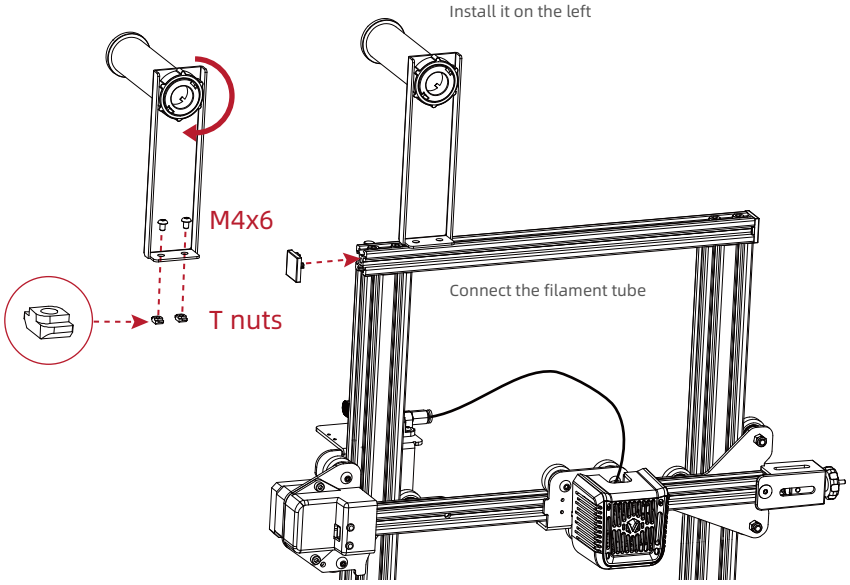


2020 profile cover *2

Hexagon socket flat round head screw M4x6 *2



T nuts *2

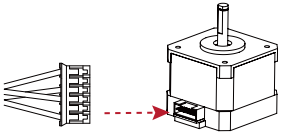


Step: Put flat round head M4x6 and T nuts into the material rack (as showed), place the spool holder on the rack and fix on the profile with screws (as showed); Then place the 2020 profile cover on both side.

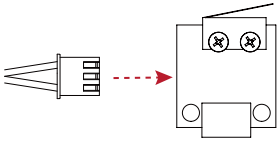
9 Wire connection

Connect X, E, Z-axis stepper motors according to the yellow label on the 6pin (4 wires) port
Connect X, Z-axis limit switches according to the yellow label on the 3pin (2 wires) port
Plug in the power cord (as showed) and toggle the switch to turn on the power

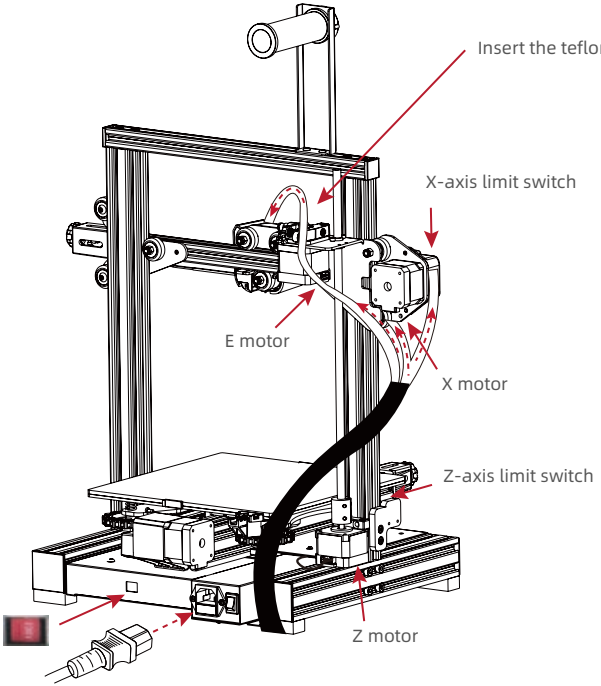
Power cable *1



X、E、Z-axis motor port



X、Z-axis limit switch



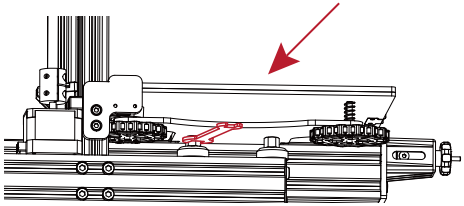
Attention

· Damage might occur if voltage setting is incorrectly. Make sure the current input voltage matches to your local power supply **(115/230V)**.
· Plug in power cord and turn power switch to 1 to turn it on.
· Do not disconnect the cables when Aquila is powered on.

10 Bed Leveling

Leveling operation video can be found on Voxelab Youtube channel

Check the steadiness of the build plate before leveing. If the build plate is unsteady, please use open-end wrench to adjust the v-wheel to steady it.



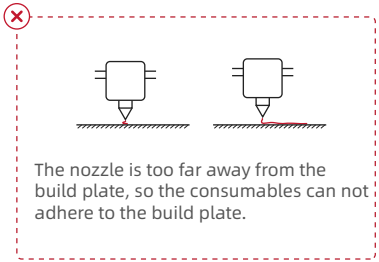
Choose [Auto home] first to ensure the extuder in the home position; then choose [Disable steppers] to close the motors.

Making sure the extruder homing has finished before close the motors.
During the leveling process, please do not touch the Teflon tube and nozzle cable.

Note: The UI information is only for reference, the actual UI may be different.

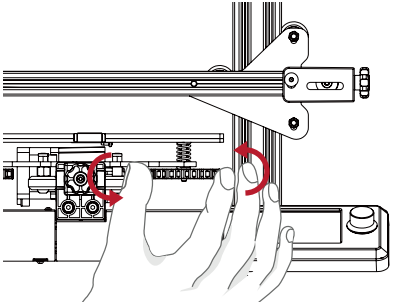
Bed Leveling

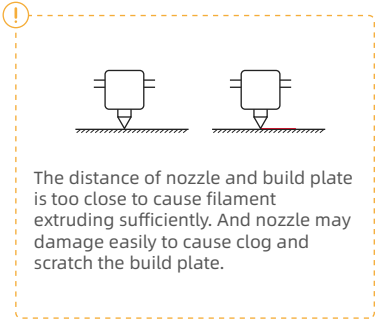
1. Move the extruder on the top of the leveling nut. Screw the nut and adjust the distance between the nozzle and the build plate. The distance is around 0.1mm. (Thickness of a piece of A4 paper)
2. Use a piece of A4 paper to assist in leveling, so that the nozzle can just scratch the A4 paper lightly. Adjust the leveling nuts on the four sides in turn until you can feel the slight resistance from the nozzle when pulling the A4 paper.
3. Test the distance between the nozzle and the print platform is enough or not. Repeat the above steps 1-2 times if necessary.



The nozzle is too far away from the build plate, so the consumables can not adhere to the build plate.

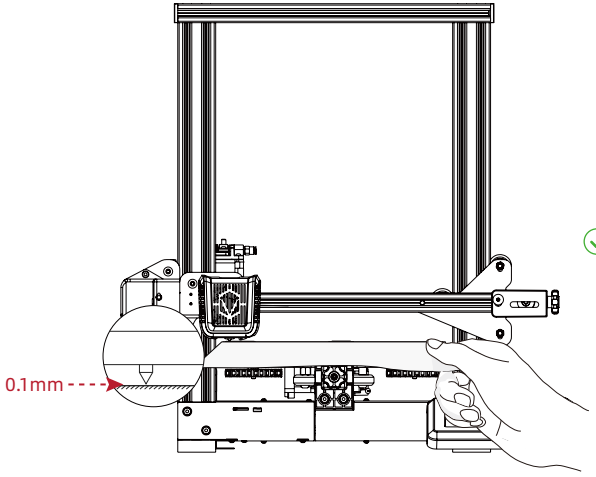
Note: If the rotating nuts can not make the nozzle touch the build plate, the position of the z-axis limit switch may be too high; please adjust it accordingly.

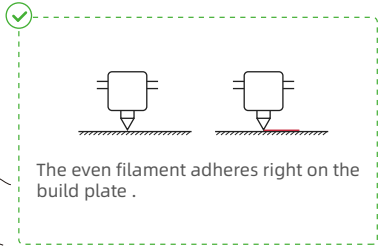




The distance of nozzle and build plate is too close to cause filament extruding sufficiently. And nozzle may damage easily to cause clog and scratch the build plate.

After adjusting the upper position of the 4 nuts, check the center position again.



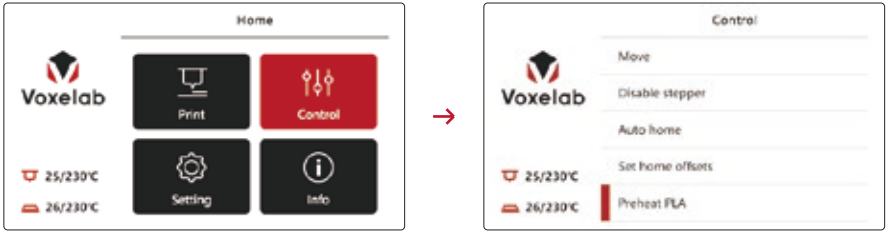


The even filament adheres right on the build plate .

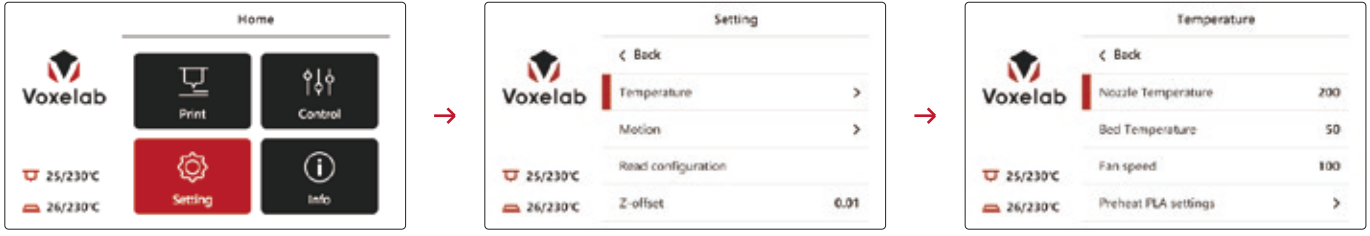
11 Preheat

Note: The UI information is only for reference, the actual UI may be different.

Method 1

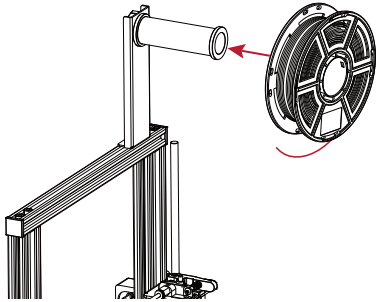


Method 2

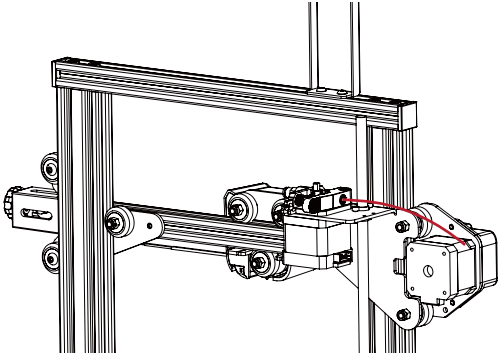


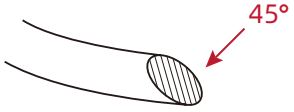
Note: The printing preheat temperature settings have been done. PLA: nozzle temperature 200℃, hot bed temperature 60℃. ABS: nozzle temperature 240℃, hot bed temperature 70℃.
For other materials or under some conditions, please adjust the parameters at the interface home page Control - Temperature - PLA/ABS preheat setting.

12 Load the filament



1. When waiting for the temperature to rise, please hang the filament on the material rack.



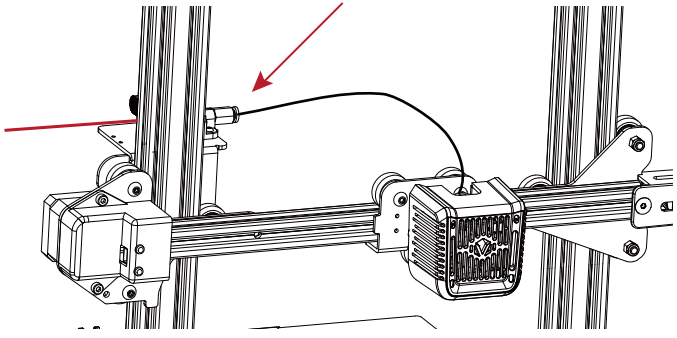


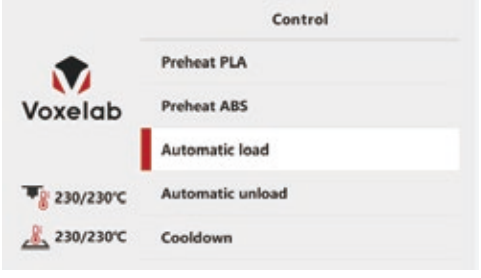
For better printing, the end of filament is as showed in the figure.

2. Press the spring to pull filament pass through (loose the spring and pull filament back and forth to see if extrusion pressure is too high or too low; adjust the screw on the force arm if the pressure is improper).
3. Pull filament into the wire tube; click <automatic input> button beneath the setting to send filament to the nozzle. Loading is completed when filament are extruded at the nozzle. Filament can be extruded to the nozzle manually when Aquila is preheated.

Load the filament

Pull the filament into this position



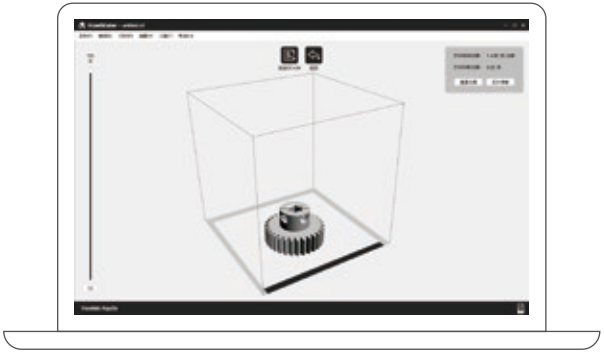


Replace the filament during printing

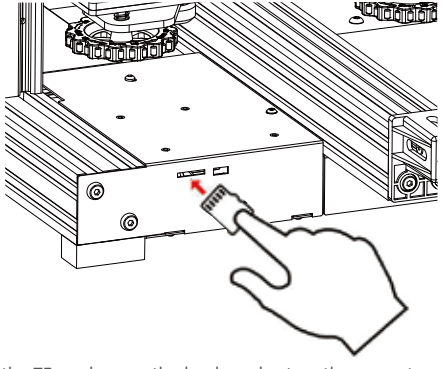
1. If filament in the nozzle, heat up the nozzle to 185°C+, draw out the filament to replace it.
2. To replace filament during the printing process, please adjust the printing speed to 10%, then replace it as introduced in Step 1.

13 Start printing

Please finish leveling first before printing, please level the build plate first, otherwise it will easily cause nozzle damage, plug and scratch the build plate.



Install the slice software on the computer.

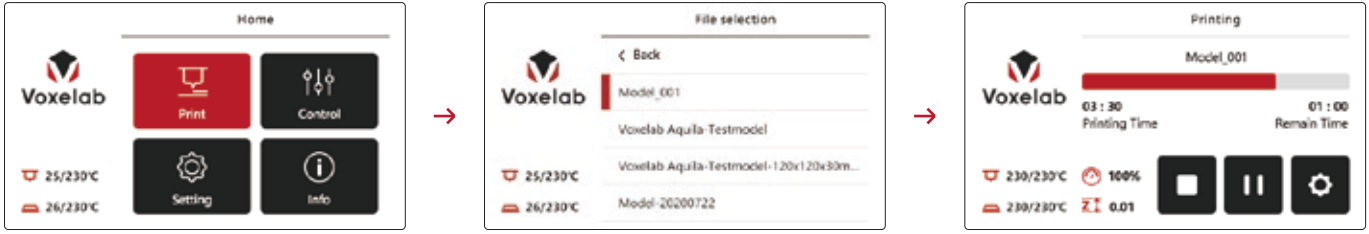


Insert the TF card, press the knob and set up the menu to print the file.

File names must be Latin letters or numbers, Chinese characters and other special symbols are unaccepted.

Start printing

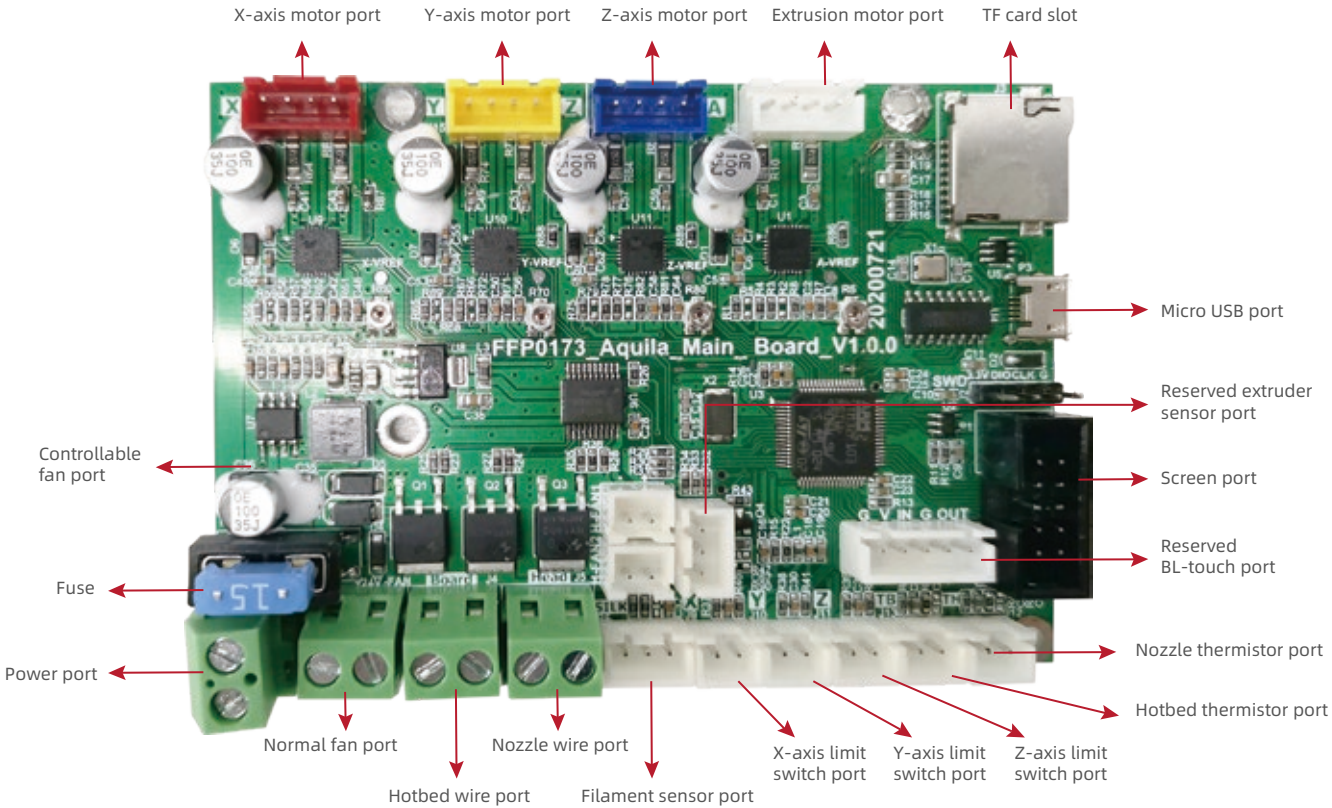
Print



Note: When you notice the improper distance between the nozzle and the build plate during printing the first layer, please click the setting button to perform the z-axis offset.

When the offset value is positive, the nozzle and the build plate gets farther; When the offset value is negative, the nozzle and the build plate get closer.

Wiring connection



Printing notice

1. The adhesions of the glass build plate may decrease after a long time of use. Please apply proper amount of glue to keep and improve the adhesion.
2. In the cold environment, abnormalities may easily happen because of warping when printing with ABS filament. Please utilize glue to enhance the adhesion; if the ambient temperature is too low, it is not recommended to print with ABS filament, which can easily make the model break away from the build plate and cause printing failure.
3. There is a certain quivering on the build plate during the printing which may cause the flatness to change. Thus please pay attention to the adhesion of the first layer when printing the second model; if the distance of build plate and nozzle is not right, please re-level it.
4. If the accuracy of model is not right, please confirm the normal installation of the synchronous belt and please adjust it to its normal state if it is too loose or too tight. If there is no error regarding the synchronous belt, please check the transmission ratio in the settings. Turn up the transmission ratio if the size turns smaller and turns down the transmission ratio if the size turns larger.
5. If the accuracy of Z-axis height dimension is not good enough, please pay attention to the compensation setting of Z-axis for precision compensa tion.
6. If the build plate will shaking, please adjust the tightness of the pulley via a wrench and slowly slide the build plate to see whether all four wheels under build plate can rotate. The pulley is at the right position when the build plate does not shaking again.
7. If there are shakes at the XZ components, please adjust the distance between the pulley and the structural section properly via an open-ended wrench; the wheel can be rotated by hand.
8. The optimal temperature for printing is 18~30℃. The printing will be affected when the ambient temperature is too high or too low.

Trouble shooting

Q: How to upgrade the firmwares?

A: 1. Insert the TF card into the card reader
2. Insert the card reader into the USB interface of the computer
3. Create a new folder named firmware in TF card
4. Copy the xx.bin file into the "firmware" folder
5. Insert the TF card into the TF card socket of the machine
6. Restart the machine

Q: How to get the firmwares?

A: Enter the official website <www.voxelab3dp.com> and download them at the <Download Center>.

Q: What if the model warps or is unable to stick to the build plate?

A: 1. The temperature of the build plate was too low; please increase its temperature;
2. The filament have no adhering or bonding effect on the build plate (Glues are recommended to enhance the adhesion);
3. The distance between the build plate and the nozzle is too far or the build plate is not leveling enough; please re-leveling the build plate.

Q: What if the accuracy of model is not good?

A: 1. Please ensure the normal status of the synchronous belt, neither loose nor tight;
2. Adjust the transmission ratio in the settings: turn up the transmission ratio if the size turns smaller and turn down the transmission ratio if the size turns larger.

Q: What if the screen turns dark?

A: 1. Please check the wire of the screen and re-plug it;
2. Refresh the firmware to see if the screen can back to normal. Contact the after-sales personnel if not.

Q: What if the build plate cannot be heated?

A: Please check the digital display of the temperature. If the temperature inproper, please replace the plate wires. Otherwise, please replace the heating wires.

Q: What if the nozzle cannot be heated?

A: 1. Please checks the digital display of the temperature; if the temperature is not displayed normally, the temperature sensor cable need to be replaced;
2. If the temperature is displayed normally, the heating cable need to be replaced.

Q: What if the axis cannot be moved?

A: check the wire of the electric motor;
Replacement method: if there is nothing wrong, please check the other axis motor via the wires of the broken motor; if the axis is able to be moved normally, there is something wrong with the electric motor; if the axis is unable to be moved, there might be something wrong with the mother board. Please check to see if any burning happens.

Trouble shooting

Q: What if the files on the TF card cannot be identified?

A: 1. Clean and wipe the storage card
2. Format the storage card
3. Replace the storage card

Q: What if the files are garbled and cannot be read?

A: 1. Modify the file name to the English or numeric format;
2. The format of files after slicing is not compatible;
3. Repair the model before slicing.

Q: What if the noise occur for the return to zero device?

A: 1. Check the return to zero sensor to see whether it has been knocked;
2. Check the lines and see whether the noises could stop if the sensor is pressed by hand;
3. Take the replacement method to check.

Q: Unable to resume printing from power failure?

A: It might be caused by different TF card. Make sure the TF card before and after the power failure are the same one.

Q: What if the offset occur on the finished model?

A: 1. Check the tightness of the synchronous belt and ensure the correct installation of the synchronous belt;
2. Slice the model anew
3. Reduce the printing speed or adjust the acceleration value;
4. Ensure that the operating temperature didn't exceed its assigned set-point temperature 30℃.

Q: Damage occurs when turn on the 3D printer.

A: It might be caused by dialing error from switch power supply, please check whether the voltage is set to the correct value. If the voltage is 110V and the power supply is 220V, damage will occur. Please select 110V/230V by switch before power on.

Q: Too much filament oozing?

A: 1. Reduce the printing temperature by 5~10℃;
2. Increase the traveling speed, or increase the with retraction length and speed.

Q: No filament coming out during printing?

A: 1. The arm force of the feeding structure might be too tight to allow the filament out. Please adjust the arm force, neither too loose nor too tight.
2. Lower the retraction length to avoid any abrasion.
3. Check whether the extruder is clogged, clean it through the needle if necessary.

After-sales Service

< ASC20200701 >

Note: The one who sells you the printer should be responsible for your after-sales service.

1. Voxelab grants all end-users a 12-month limited warranty for all Voxelab 3D printers (except the Voxelab extruder) and a 3-month warranty for Voxelab FFF Extruder.
2. If Voxelab 3D printer fails during normal and proper use within the warranty period (judged by Voxelab engineers), Voxelab will provide users with free maintenance services or remote after-sales support.
3. The warranty period starts from the outbound date, or starts from the invoice date if clear and confirmed invoice is provided.
4. Voxelab will repair or replace only the defective parts with new or reconditioned parts or products that are functionally equivalent or superior to those originally supplied. If a part is repaired or replaced during the warranty period, the warranty period still remaining for the entire printer will apply to this part.

Parts Excluded from This Warranty

Build Tape
Build Plat
USB Stick
USB Cable
TF Card
Card Reader
Filament
Filament Spool
Plastic Scraper
Metal Scraper
Allen Wrench
Stamping Wrench
Tools Bag
Accessories
Glue

* Voxelab extruder kit shall be purchased independently due to upgrading.

What is not covered

- Unable to provide valid After-sales Service Card or serial No.(Including but not limited to lost, alter or fuzzy cannot be confirmed);
- Damage(s) caused by improperly or incorrectly performed modifications, alterations or repair;
- Damage(s) due to operation under improper environment(damp, wet or other extreme weather);
- Exterior scratch or flaw caused by abrasion, aging or normal use;
- The warranty period of printer or part has expired;
- Damage(s) caused in service shops unauthorized by Voxelab;
- Damage(s) caused by improperly installation, use or operation;
- Damage(s) caused by abuse(overloaded working), misuses;
- Damage(s) caused by using unauthorized spare parts or poorquality filament ;
- Damage(s) caused by using 3rd party software;
- Damage(s) caused by force majeure(such as a lightning strike, fire, earthquake, floods or any other event beyond human control);
- Damage(s) caused by using 3rd party parts;

After-sales Service Registration Form

Series No.: _____ Purchase from: _____

Fault Description:_____

_____

_____

Tel.: _____ Contact: _____

Add.: _____

- Please fill in this form carefully, cut out this form and mail it back to Voxelab together with the printer, or download this form from **www.voxelab3dp.com**, fill in this form and mail it to **aftersales@voxelab3dp.com**. After-sales service shall not be provided without this form.
- Please contact your printer's reseller to get After-sales service help if your printer is not purchased on official Voxelab website.

Physical objects and final images might be distinct from the above ones due to differences between printer models.
Voxelab reserves final explanation rights.

Voxelab

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