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LONGER TECHNOLOGY  
**LK4 Pro** 3D PRINTER

User Manual  
Version 1.0

## Catalog

A. Product information.....	3
(1) Model parameter.....	3
(2) Machine introduction.....	4
(3) Nozzle module exploded view.....	4
(4) Machine assembly.....	5
1. Gantry installation.....	5
2. X-axis installation.....	6
3. Mounting the x-axis beam.....	9
4. Install the gantry upper beam.....	9
5. Mounting screw.....	9
6. Install Teflon tube.....	10
7. Install the z-axis limit switch.....	11
8. Mounting aluminum substrate.....	11
9. Wiring.....	12
10. Screen wiring.....	12
11. Mounting rack.....	13
12. Assembly completed.....	13
(5) Power regulation.....	14
(6) leveling method.....	15
B. Machine operation.....	16
(1) Machine control interface description.....	16
(2) Home interface.....	18
(3) Move interface.....	19
(4) Tune interface.....	20
(5) Utilities interface.....	22
(6) Print interface.....	25
C. Cura installation and operation software.....	26
(1) Slice software offline printing instructions.....	29
(2) Software parameter setting.....	32
D. Operation for online printing.....	35
E. Resume printing and filament run-out detection function.....	38
(1) Power failure.....	38
(2) Broken material detection.....	39
F. FAQ manual.....	40
Question1: How to update the firmware?.....	40
Question 2:What if the filament does not discharge from the machine?.....	41
Question 3:.....	42
Question 4: What should I do if I cannot resume printing after power shutdown?.....	43
Question 5:.....	43
Question 6: .....	44

## Safety Precautions

1) The temperature of the nozzle parts can reach 250 °C during the operation of the machine. To ensure your safety, it is forbidden to touch the model and nozzle directly with your hand while the printer is printing or cooling.

2) During the operation of the machine, it is forbidden to reach into the machine to prevent pinching.

3) The working voltage is 110~220V AC voltage 50HZ AC. The three-pin socket must be grounded. Do not use other power sources to avoid damage to components or fire, electric shock and other accidents.

Note: Before powering on, please check whether the input voltage value of the switching power supply meets the voltage standard of the country or region.

4) When the machine is working continuously for  $\geq 96$  hours, it should be stopped for 1-3 hours.

### Consumables

The consumables are not used after unpacking or for a long period of time after the print model is completed. The consumables should be taken out of the printer and sealed to prevent the consumables from being exposed to the air for a long time, causing moisture and affecting the print quality. At the same time, when the consumables are removed

The front end of the consumable should be fixed on the tray to avoid consumables and affect the next print.

To use this printer, it is recommended to use the supplies provided by the company. At present, the quality of consumables sold in the retail market is uneven, and printing is prone to breakage.

Staggering and clogging the printer nozzle, etc., and irreversible damage to the heating components of the nozzle, the extrusion motor and the extrusion gear. The company will not guarantee the printer due to the use of consumables other than our company.

Environmental requirements

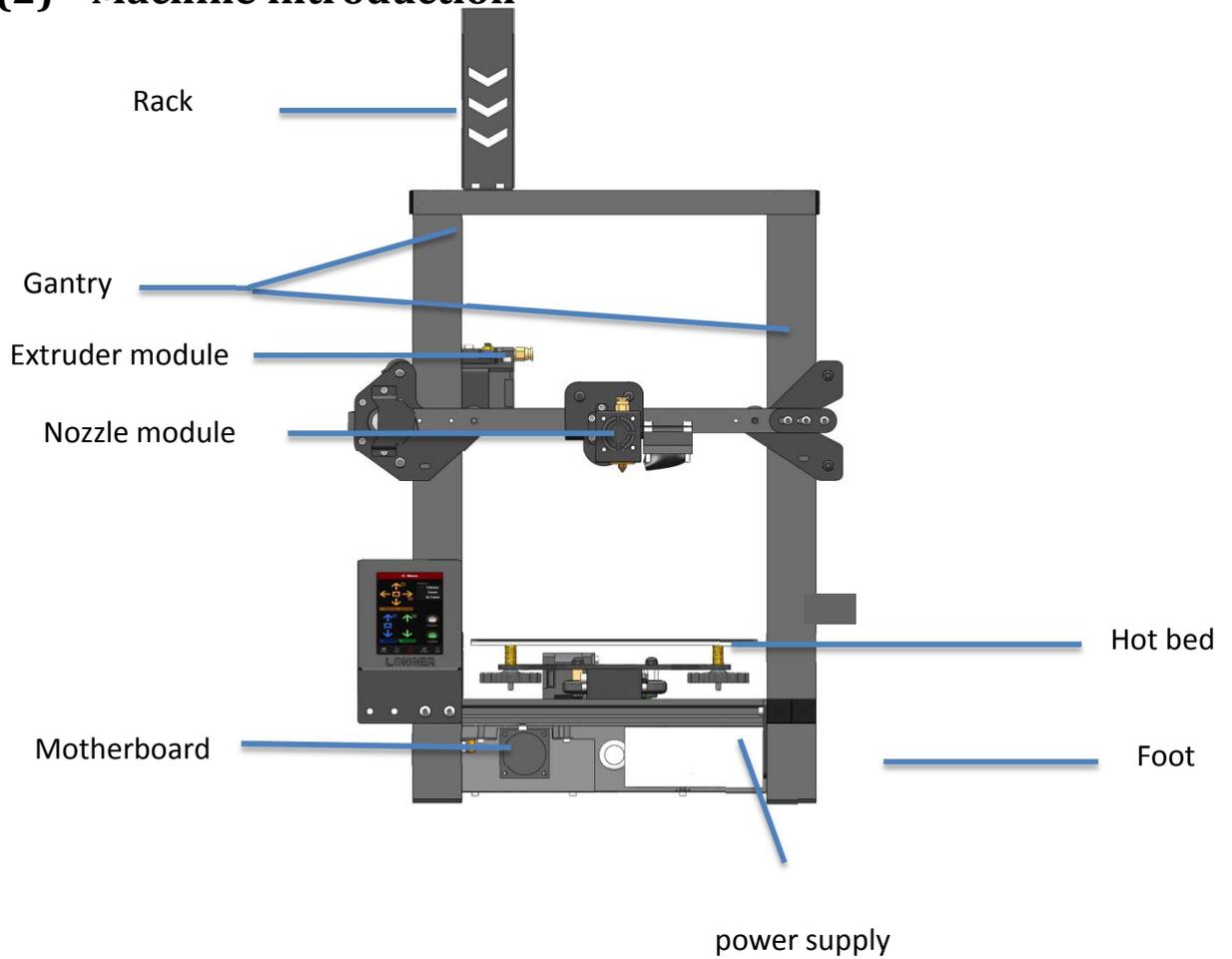
Temperature requirement: 10°C~30°C, humidity requirement: 20%~50%, this 3D printer can work normally within this range; beyond this range, this 3D printer will be unable to achieve the best print results.

## A. Product information

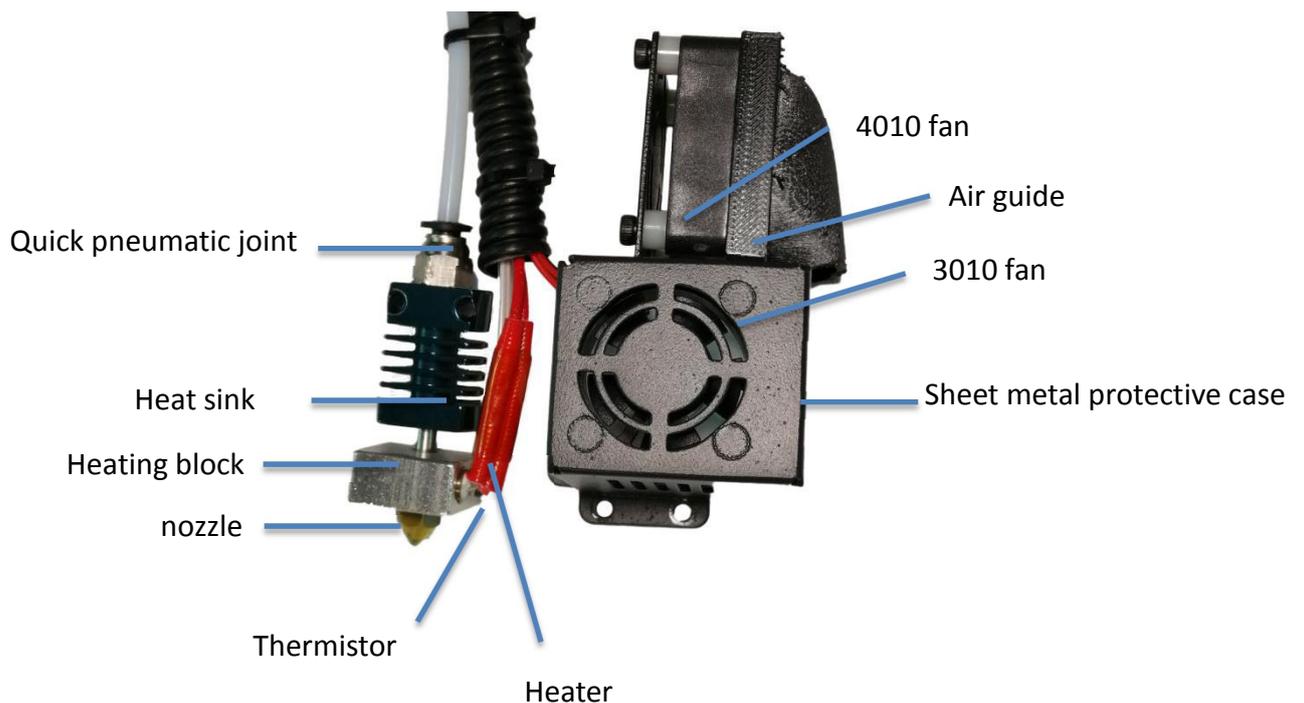
### (1) Model parameter

model	LK4 Pro	Machine size	402*382*655 MM
frame	Classic aluminum frame	Machine weight	7.8KG
Molding	FDM (hot melt production)	Package dimensions	467*412*187 MM
Number of nozzles	1	Consumable color	Multi-color optional
Molding size	220*220*250mm	Power requirement	Output 24V
Layer thickness	0.1-0.4mm	operating system	Windows, Linux, MAC
Memory card offline printing	Support TF card	Interface language	English
Serial screen	YES	Environmental requirements	Temperature 10-30 ° C Humidity 20-50%
printing speed	Not more than 120mm/s	Nozzle temperature	Room temperature to 250 ° C
Nozzle diameter	0.4mm	Hot bed	3mm thick integrated heating aluminum plate, forming platform
Slicing software	Cura, repetier-host	Support consumables	PLA, ABS, wood, copper consumables
file format	STL, G-Code, OBJ	Consumable diameter	1.75mm

## (2) Machine introduction

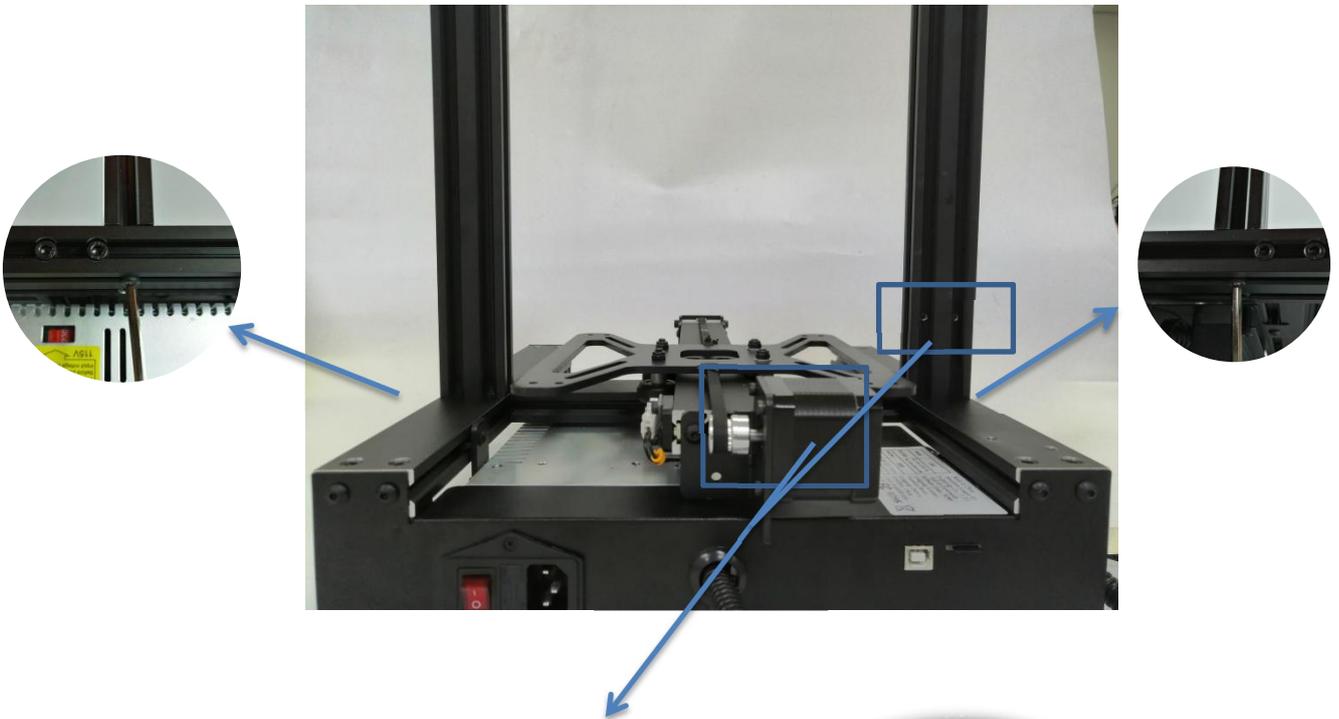
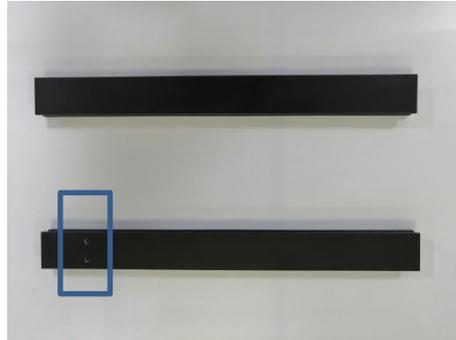
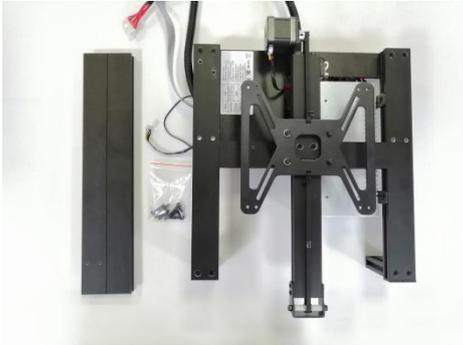


## (3) Nozzle module exploded view



## (4) Machine assembly

### 1. Gantry installation

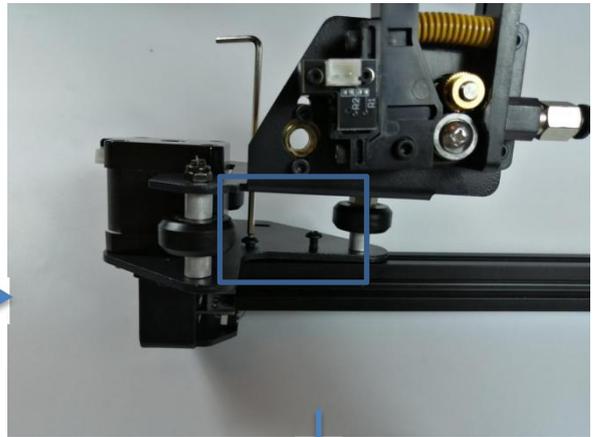


Two blue boxes in the picture, need to be in one direction

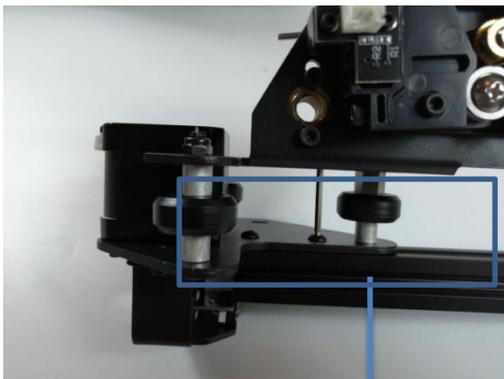
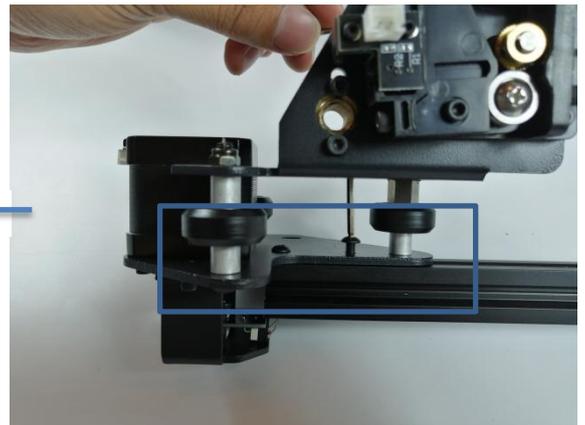


The screw used is M5\*20

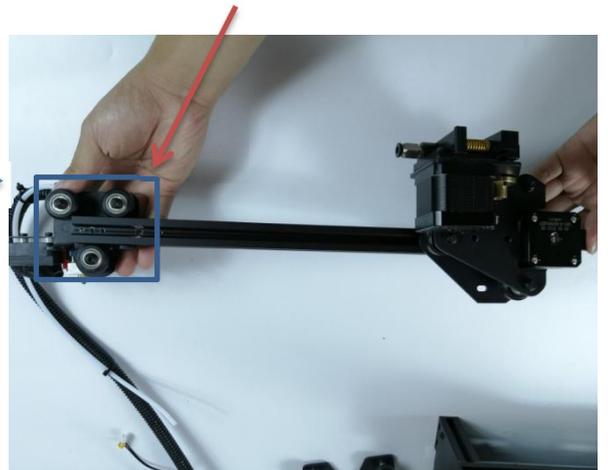
## 2. X-axis installation

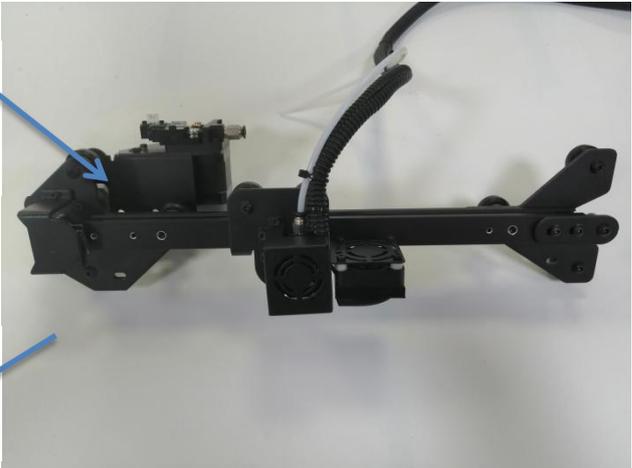
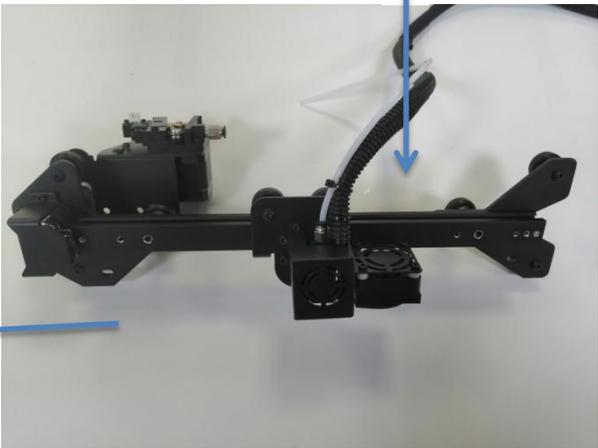
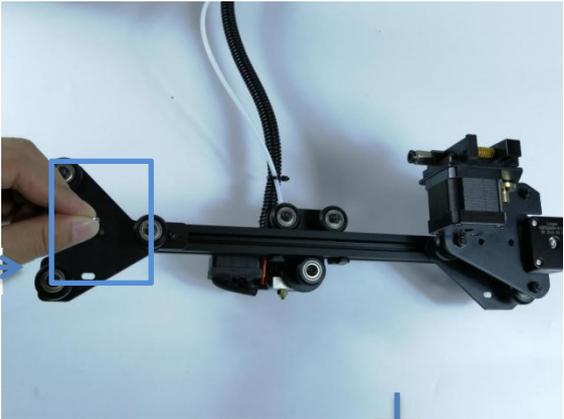


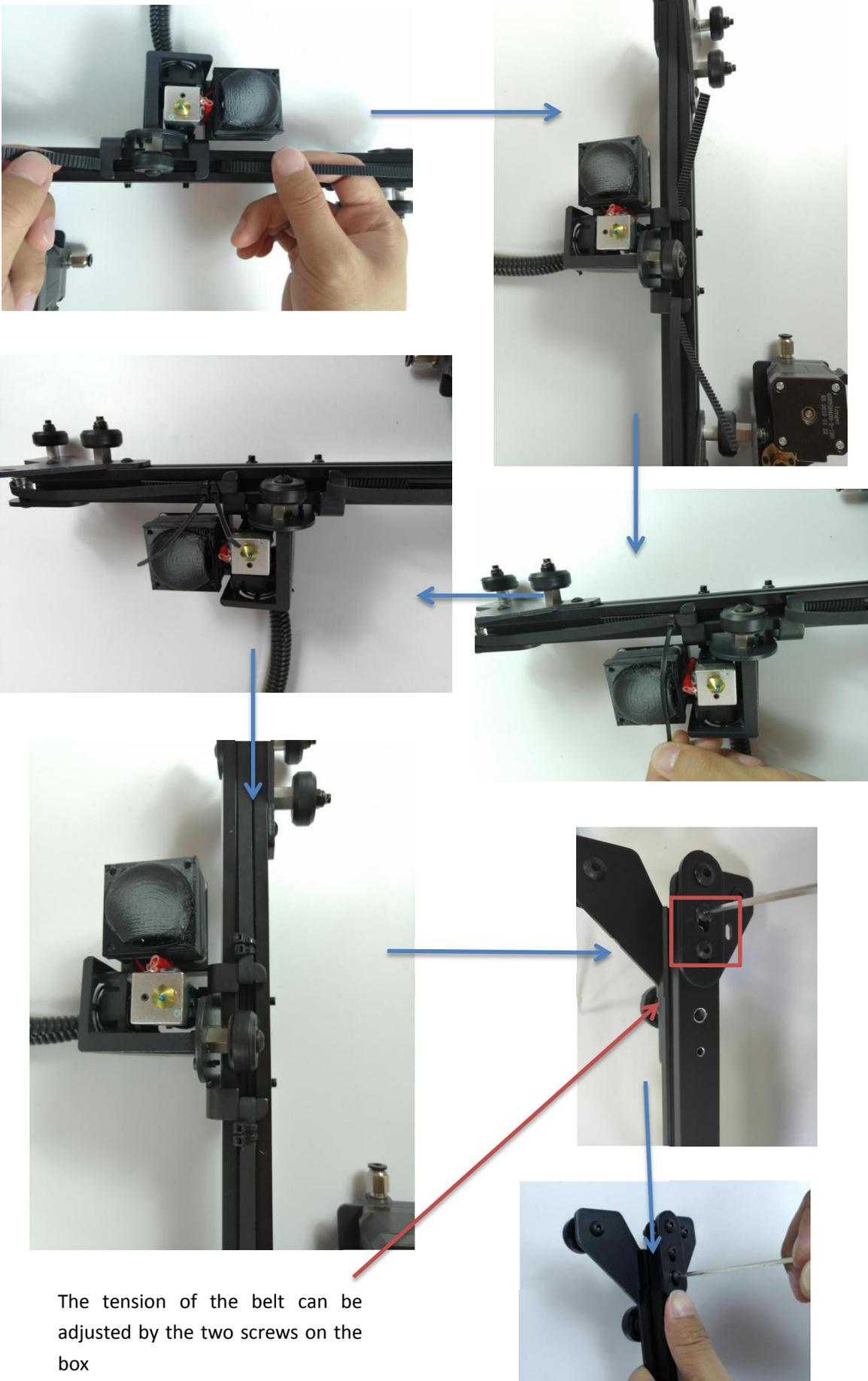
Screws are all M4\*16



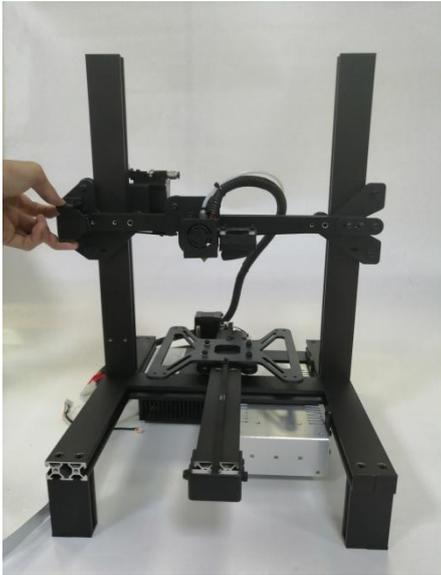
If the nozzle block wheel cannot enter, use a wrench to adjust the eccentric nut.







### 3. Mounting the x-axis beam



If the wheel does not fit in, you can adjust the wheel with the eccentric nuts on both sides. Let the X-axis beam enter

### 4. Install the gantry upper beam



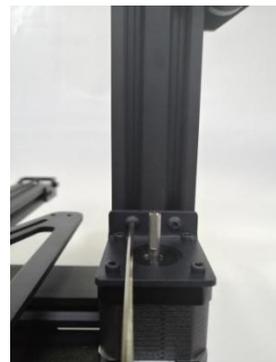
Use 4 M5\*20



### 5. Mounting screw

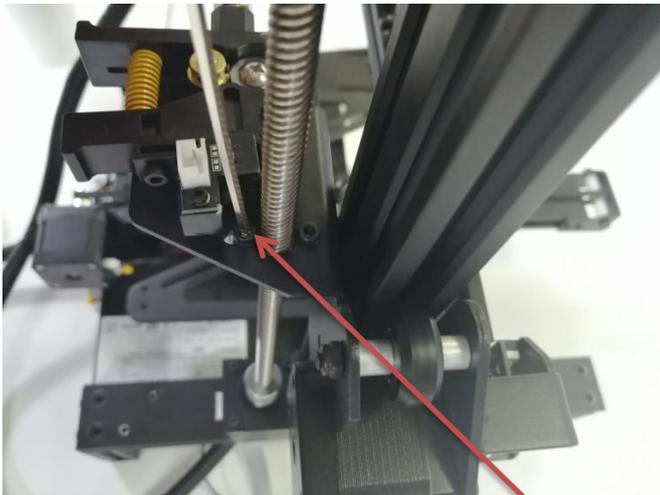


Use 2 M4\*16





Let the lead screw snap into the coupling and the motor shaft is also aligned with the lead screw. Tighten the top wire



Adjust the screw movement by adjusting these two screws. The two screws cannot be tightened too tightly. Turn the coupling by hand to adjust the movement of the lead screw.

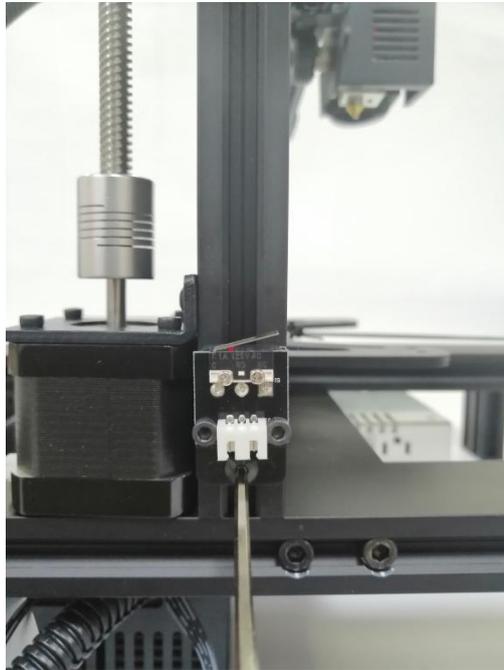
## 6. Install Teflon tube



note Teflon tube and line direction

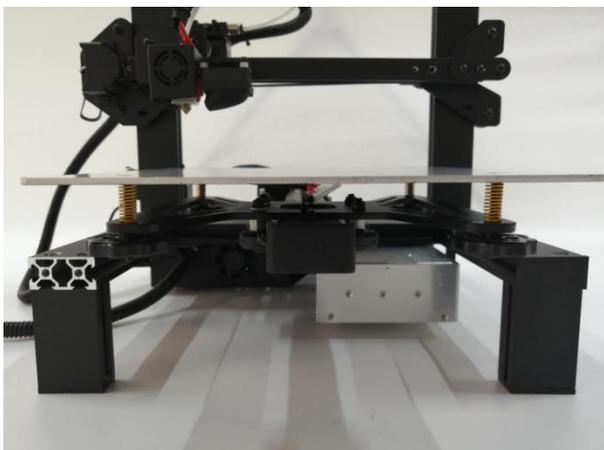
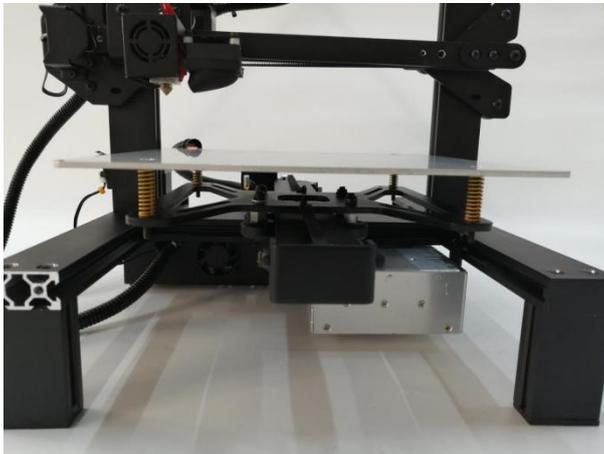


## 7. Install the z-axis limit switch



Z-axis limit opening installation is about 12mm from the base (this is adjustable)

## 8. Mounting aluminum substrate



## 9.Wiring



1. X motor line      2. X limit switch line      3. E-axis motor line  
4. E-axis break detection      5. Z-axis motor line      6.Z-axis limit switch

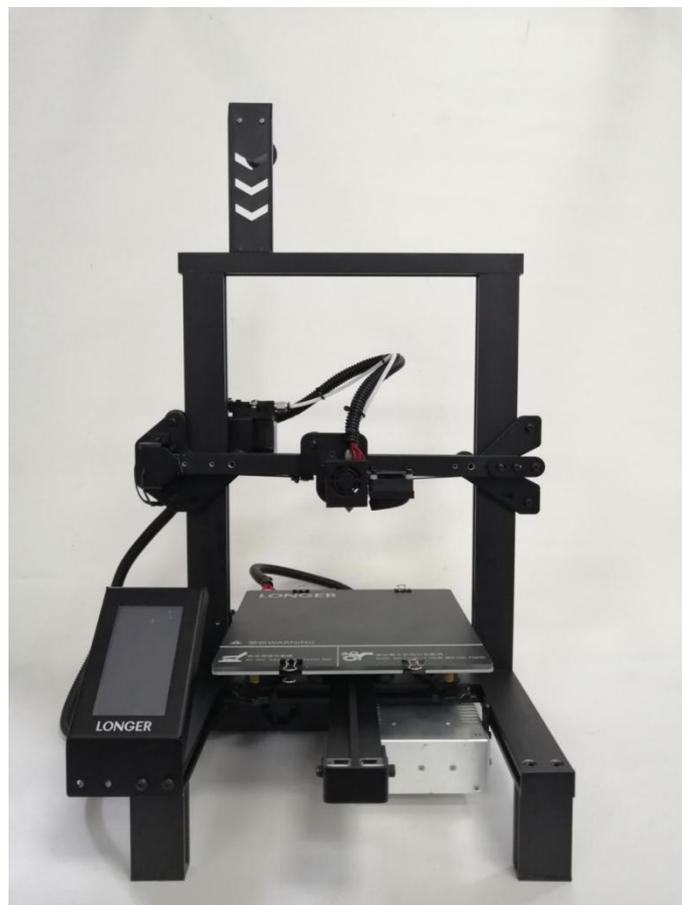
## 10. Screen wiring



## 11. Mounting rack



## 12 .Assembly completed



## (5) Power regulation



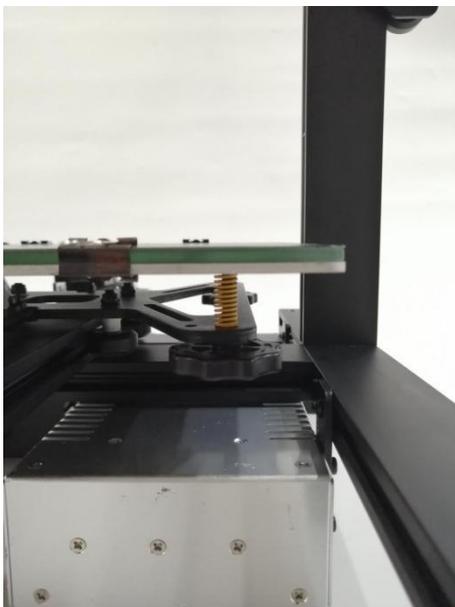
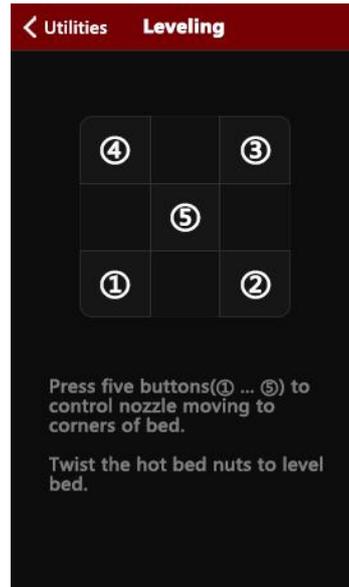
If the access voltage is 220V, please adjust the power supply in the control box to 220V, please be sure to confirm before powering on. Otherwise it will burn the power



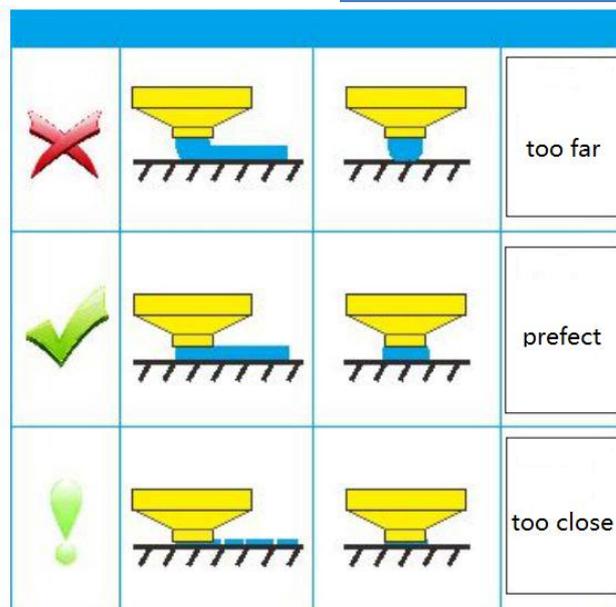
If the access voltage is 110V, please adjust the power supply in the control box to 110V, please be sure to confirm before powering on. Otherwise it will burn the power

## (6) leveling method

You can manually click the XY zero and Z zero in the Movement interface, then unlock, manually move the hot bed and the nozzle, and then adjust the leveling nut so that the distance from the nozzle to the hot bed is about one A4 paper thickness.



Turn on the machine, click the levelling button, click the four buttons in turn, the nozzle will move to the corresponding position correspondingly. After waiting to move to the corresponding position, you can manually adjust the hand nut to adjust the distance between the nozzle and the hot bed to approximately one A4. Thicken the paper, tighten the screw [tighten counterclockwise], and increase the distance between the heating plate and the nozzle. Loosen the screw [screw in the clockwise direction] and the heating plate will be close to the nozzle. Adjust the other three points in turn to complete the leveling.



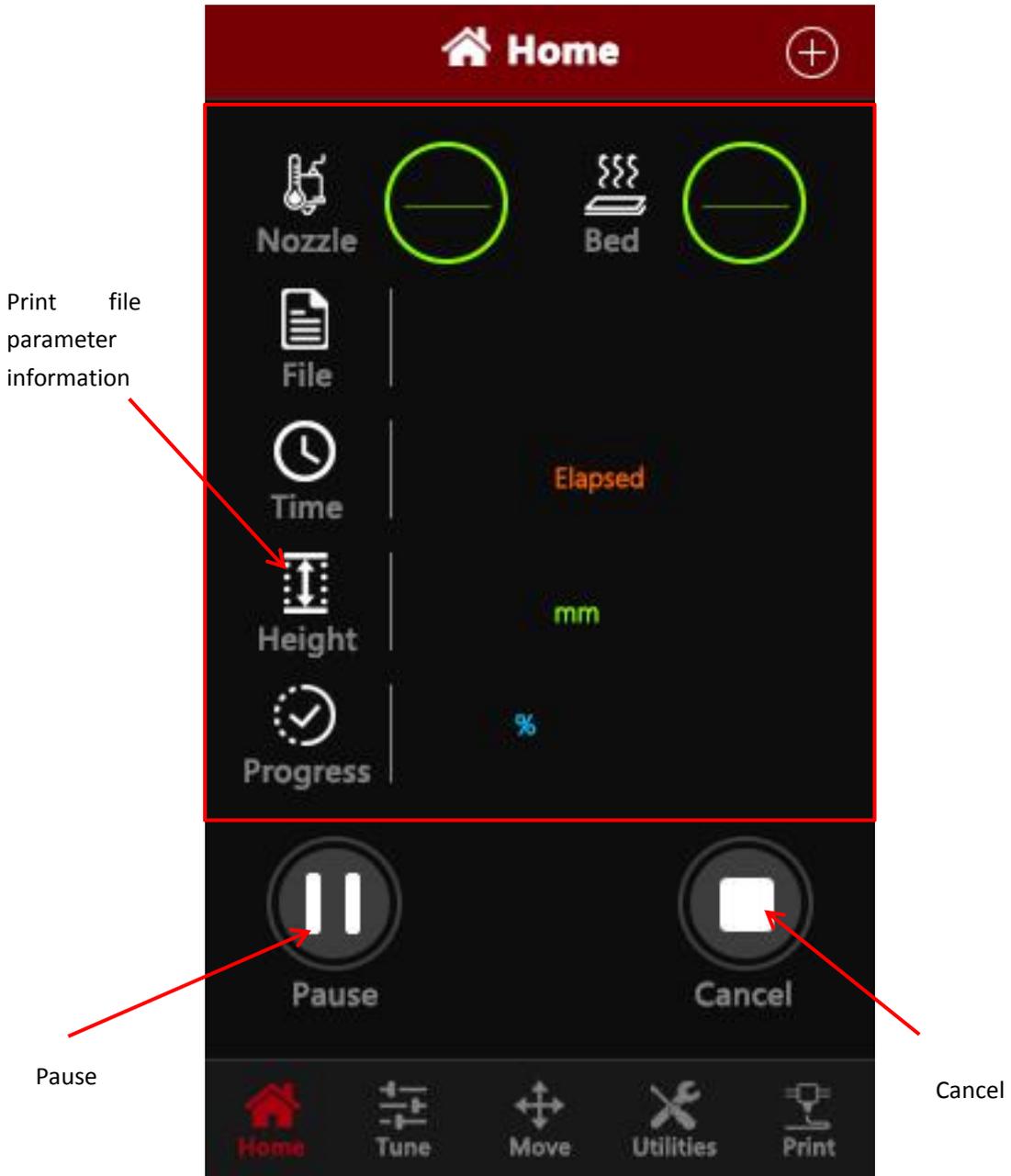
## B. Machine operation

### (1) Machine control interface description

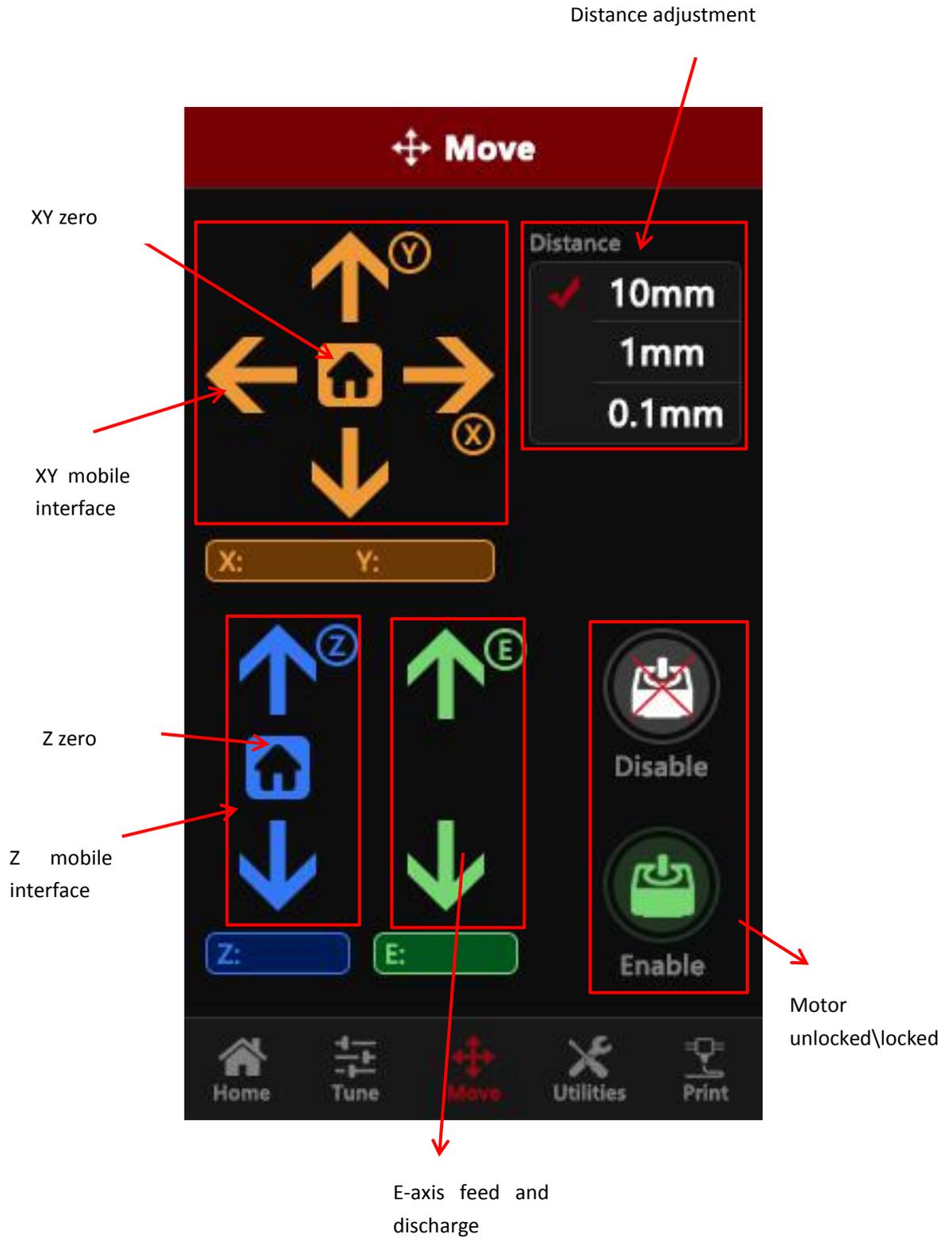
Primary interface	Secondary interface	Explain	
HOME	Nozzle temp	Display nozzle temperature	
	Heatbed temp	Display the temperature of the hot bed	
	File	The name of the file	
	Time	Print time	
	Progress	Print process	
	Height	Print height	
	Pause	time out	
	Cancel	End	
Move	X,Y	X, Y left and right movement and zeroing	
	Z	Z axis movement	
	E	In and out of consumables	
	Distance	Moving distance	
	Disable	Unlock the motor	
	Enable	Locking motor	
Tune	Nozzle temperature	Increase\lower	Nozzle temperature control
		Cool	Temperature back to 0 ° C
		step (°C)	Temperature control step size
	Heatbed temperature	Increase\lower	Hot bed temperature control
		Cool	Temperature back to 0 ° C
		step (°C)	Temperature control step size
	Fan speed	Increase\lower	Fan speed control
		stop fan	The fan stops rotating
		step	Step speed of the fan speed
	Feed rate	Increase\lower	Print speed

			magnification
		Restore	Restore default (100%)
		step	Print speed step size
	Nozzle flow rate	Increase\lower	Nozzle flow control
		Restore	Restore default (100%)
		step	Nozzle flow step size
LEDs	Open \close	LEDs light control	
Utilities	Filament	Nozzle temp	Nozzle temperature display
		Heatbed temp	Hot bed temperature display
		Filament type	PLA\ABS
		Cool	Nozzle\ Heatbed
		Filament change	Feeding/returning length control
	Load\Unload	Feeding/returning control	
	Leveling	/	/
/		/	
Print	TF card	Select print file	
	open	Start printing	

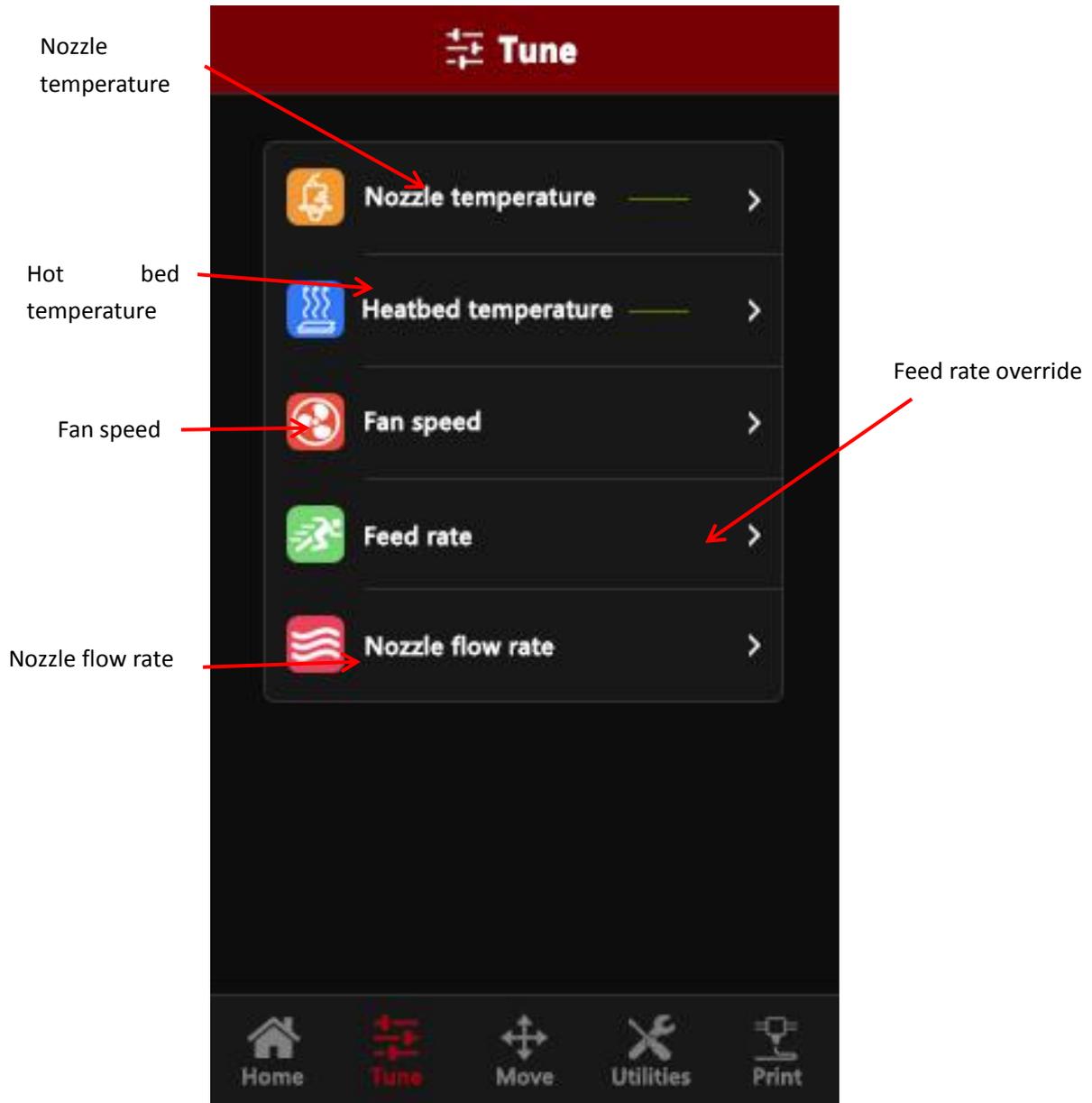
## (2) Home interface

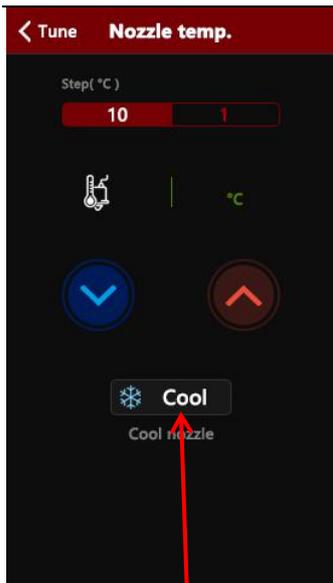


### (3) Move interface

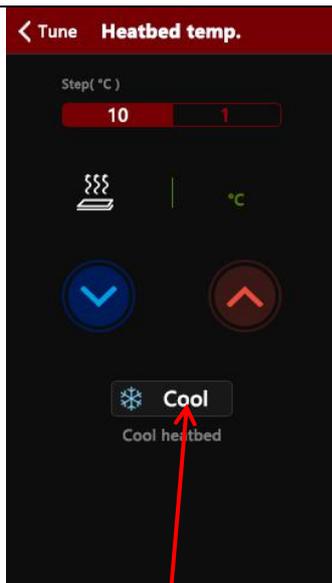


## (4) Tune interface

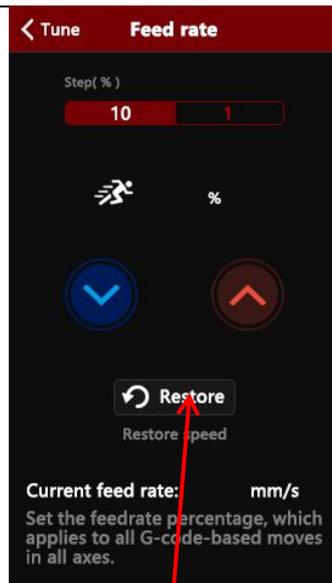




cooling

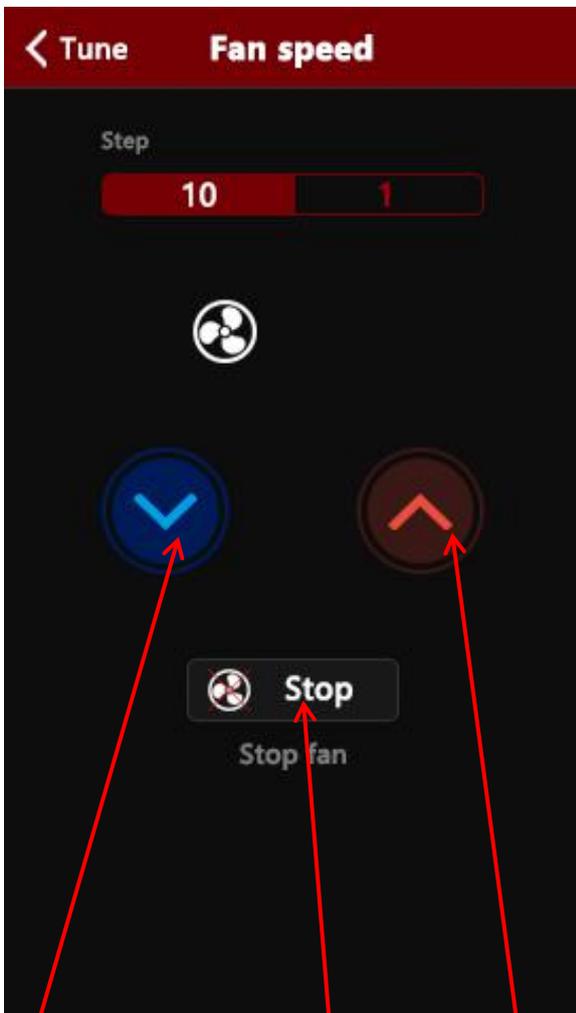


cooling



restore

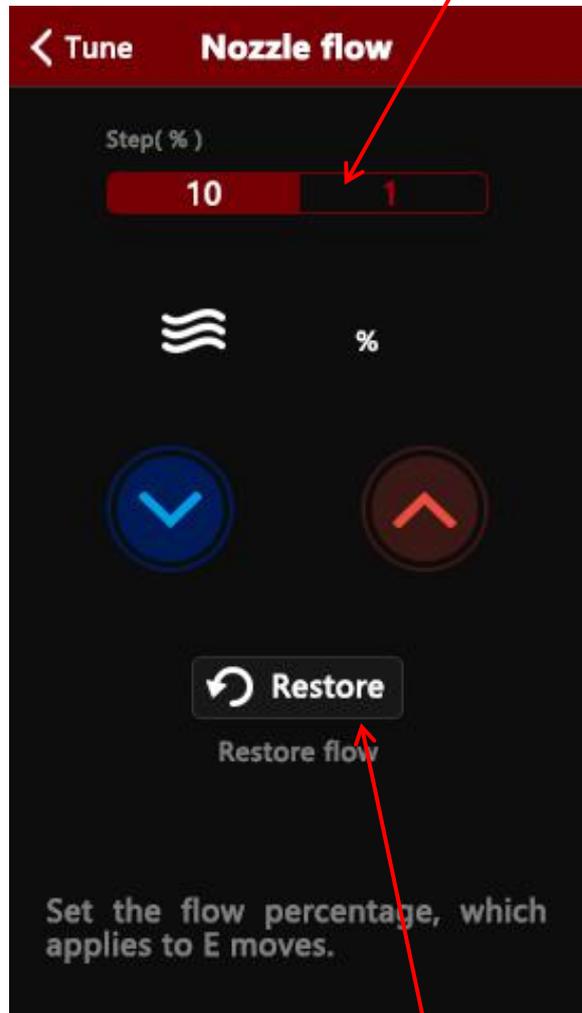
Distance adjustment



increase

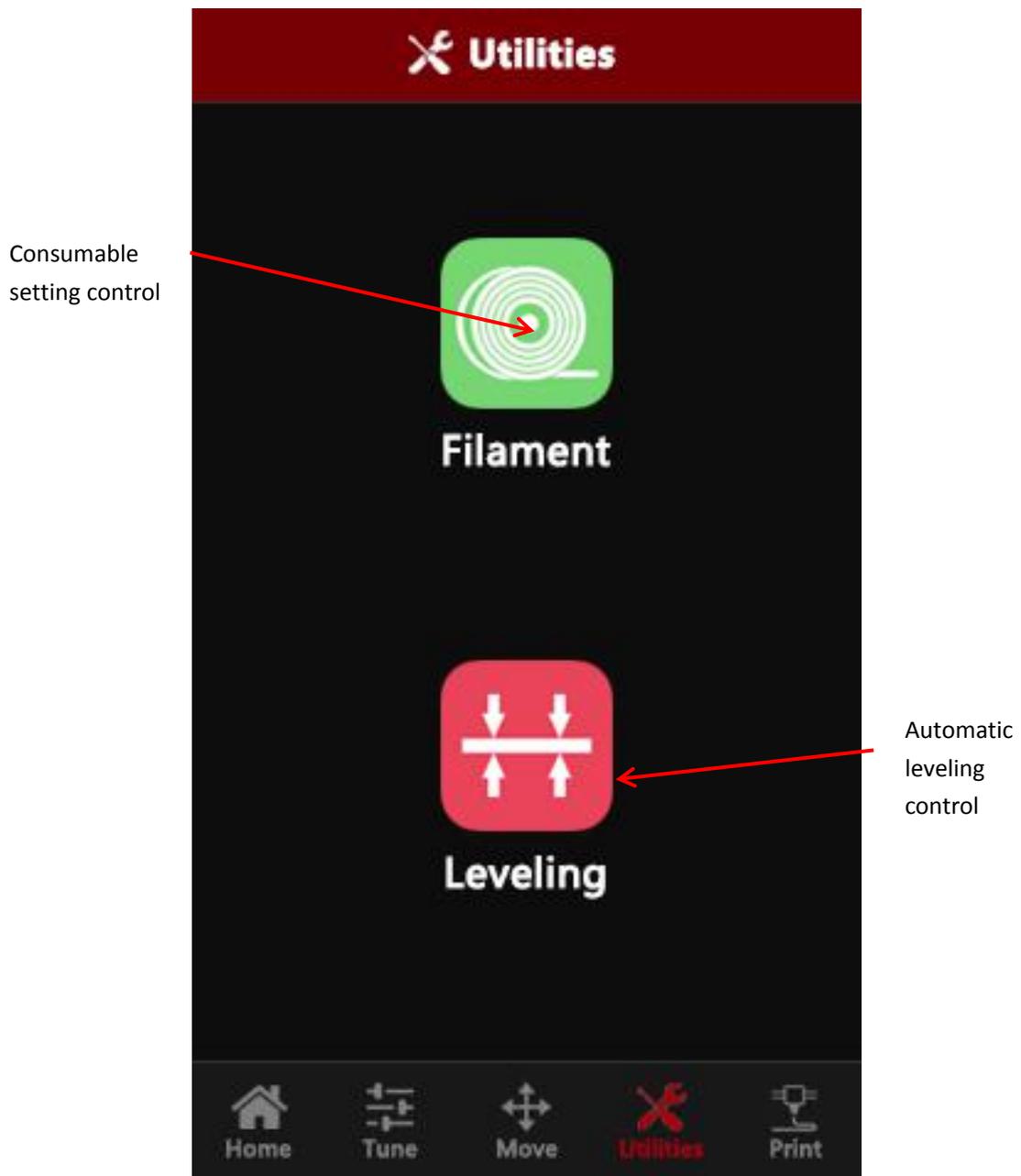
stop

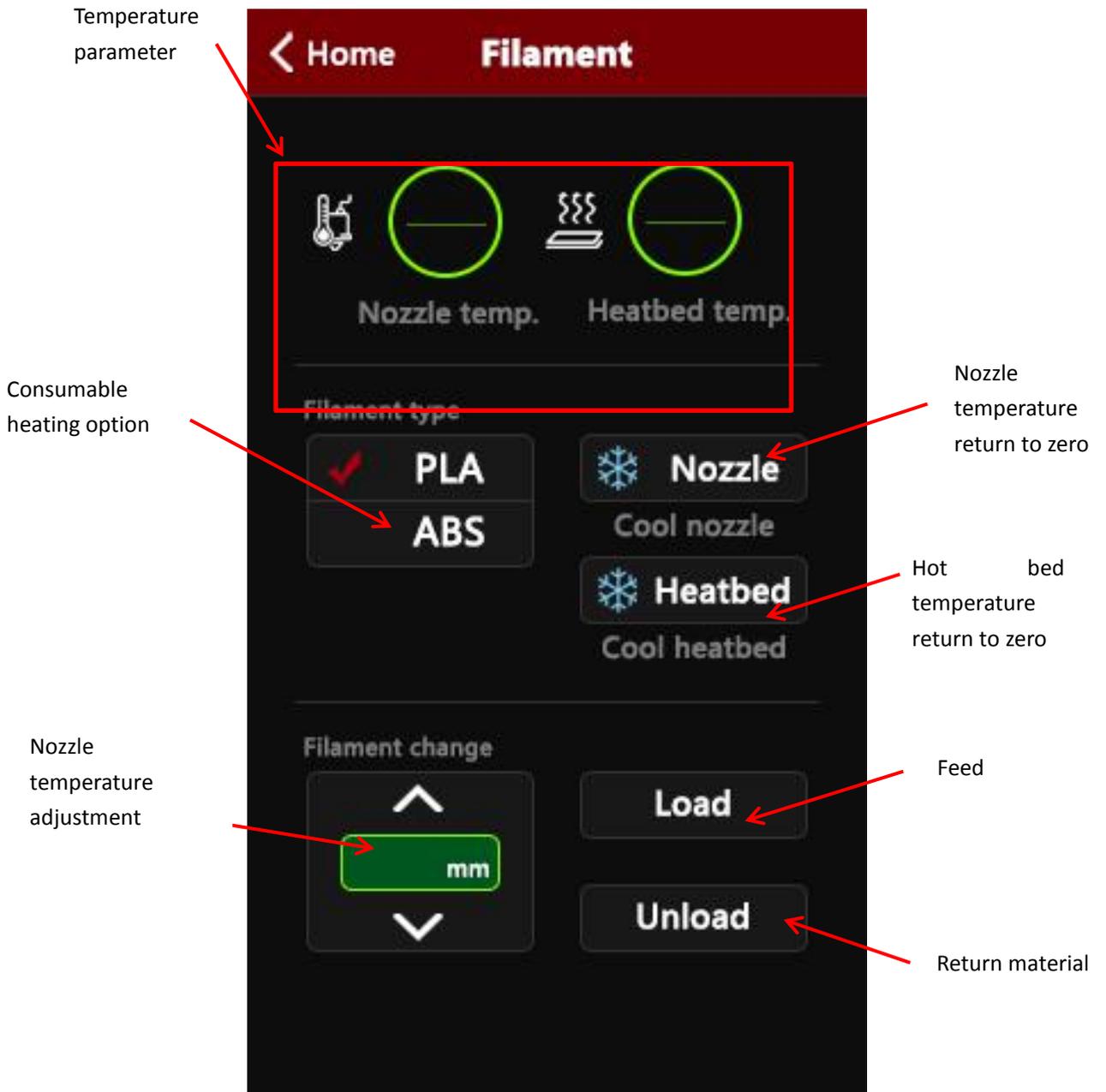
reduce



restore

## (5) Utilities interface





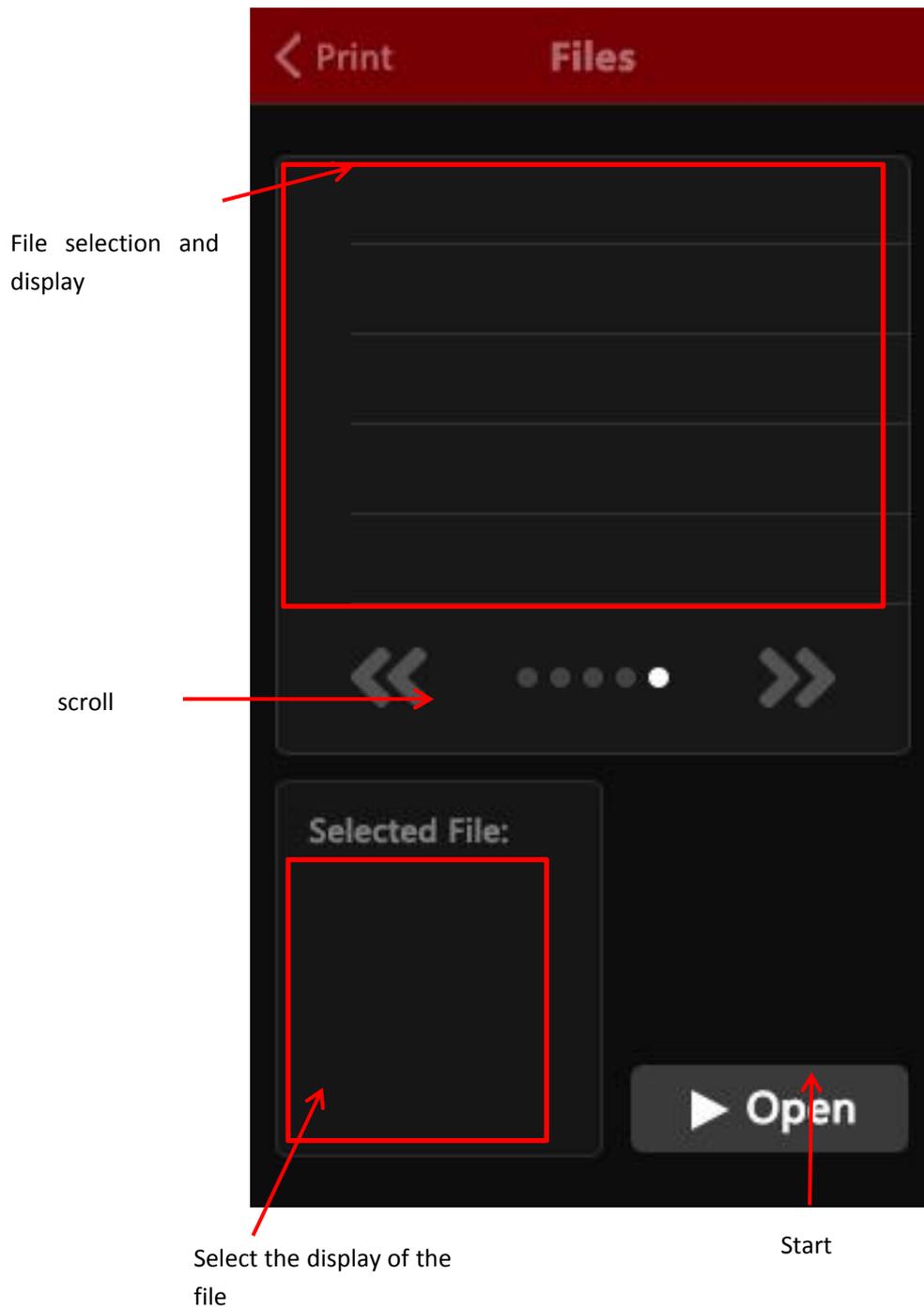
**< Utilities    Leveling**



Press five buttons(① ... ⑤) to control nozzle moving to corners of bed.

Twist the hot bed nuts to level bed.

## (6) Print interface



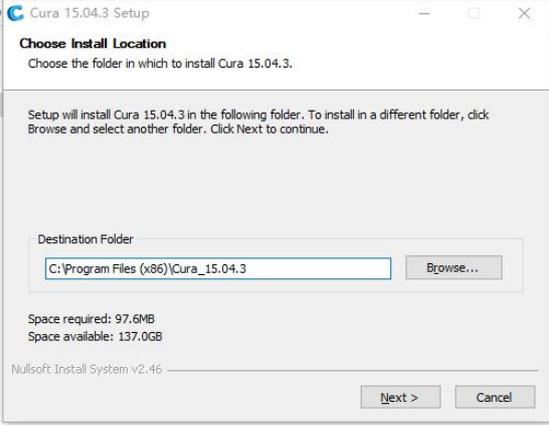
## C. Cura installation and operation software

3.Model	2018/9/6 20:12	文件夹	
4.Cura_15.04.3	2018/9/6 20:12	文件夹	
5.Device Driver	2018/9/6 20:12	文件夹	

名称	修改日期	类型	大小
util	2019/6/15 星期...	文件夹	
Cura_15.04.3.exe	2016/3/4 星期五 ...	应用程序	20,418 KB
LK4 Pro.ini	2018/10/24 星期...	配置设置	11 KB



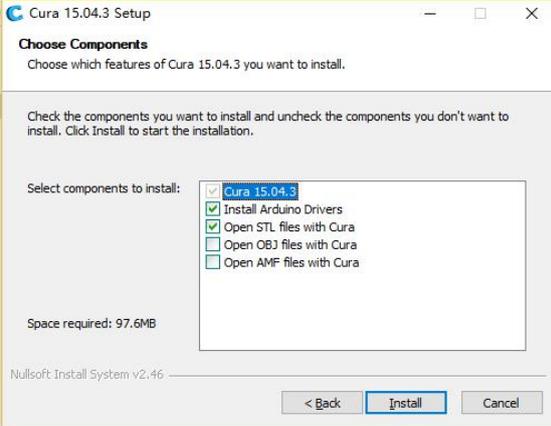
**Choose Install Location**  
Choose the folder in which to install Cura 15.04.3.

Setup will install Cura 15.04.3 in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder  
C:\Program Files (x86)\Cura\_15.04.3

Space required: 97.6MB  
Space available: 137.0GB

Nullsoft Install System v2.46



**Choose Components**  
Choose which features of Cura 15.04.3 you want to install.

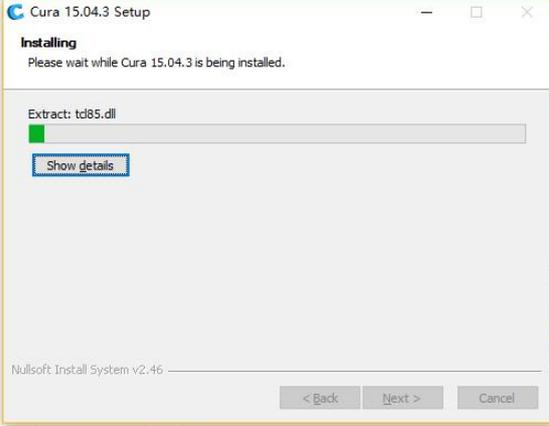
Check the components you want to install and uncheck the components you don't want to install. Click Install to start the installation.

Select components to install:

- Cura 15.04.3
- Install Arduino Drivers
- Open STL files with Cura
- Open OBJ files with Cura
- Open AMF files with Cura

Space required: 97.6MB

Nullsoft Install System v2.46



**Installing**  
Please wait while Cura 15.04.3 is being installed.

Extract: td85.dll

Show details

Nullsoft Install System v2.46



**Welcome to the Device Driver Installation Wizard!**

This wizard helps you install the software drivers that some computers devices need in order to work.

To continue, click Next.



**Completing the Device Driver Installation Wizard**

The drivers were successfully installed on this computer. You can now connect your device to this computer. If your device came with instructions, please read them first.

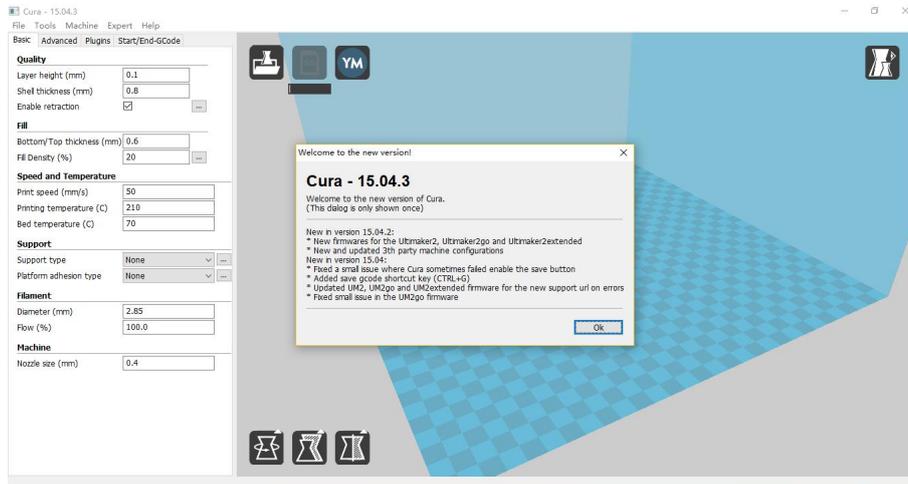
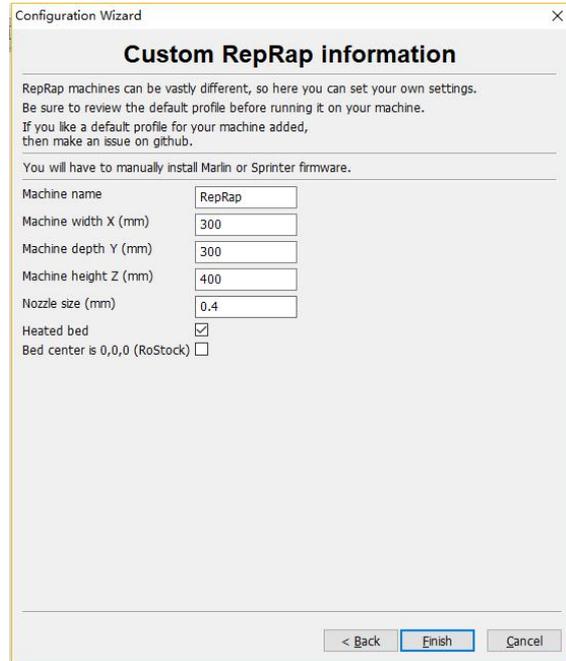
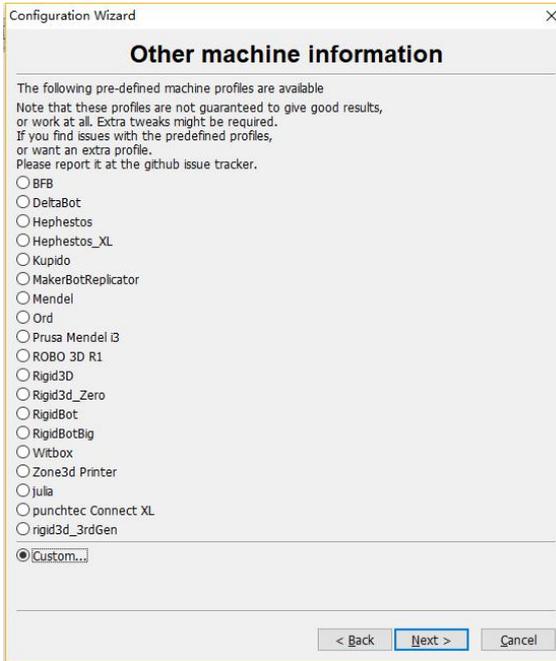
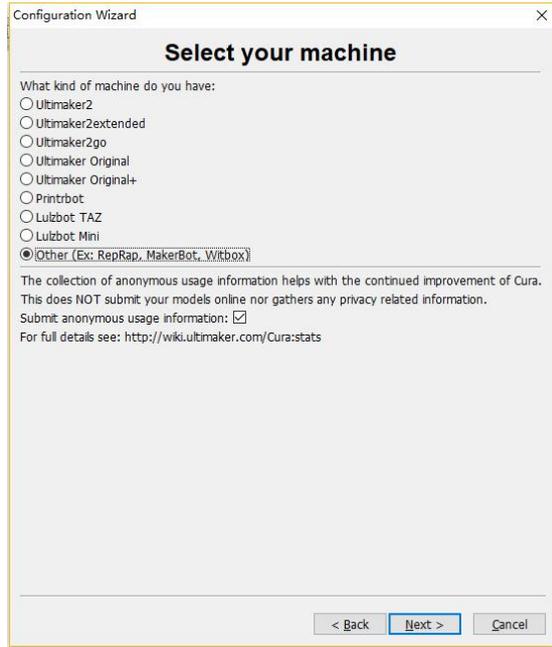
Driver Name	Status
✓ Arduino LLC (www.ardui...	Ready to use

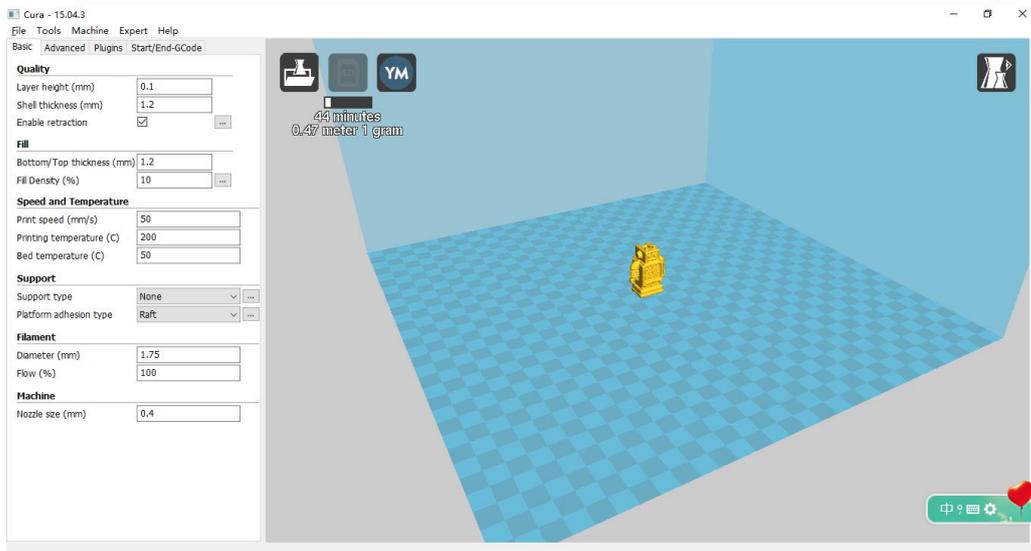
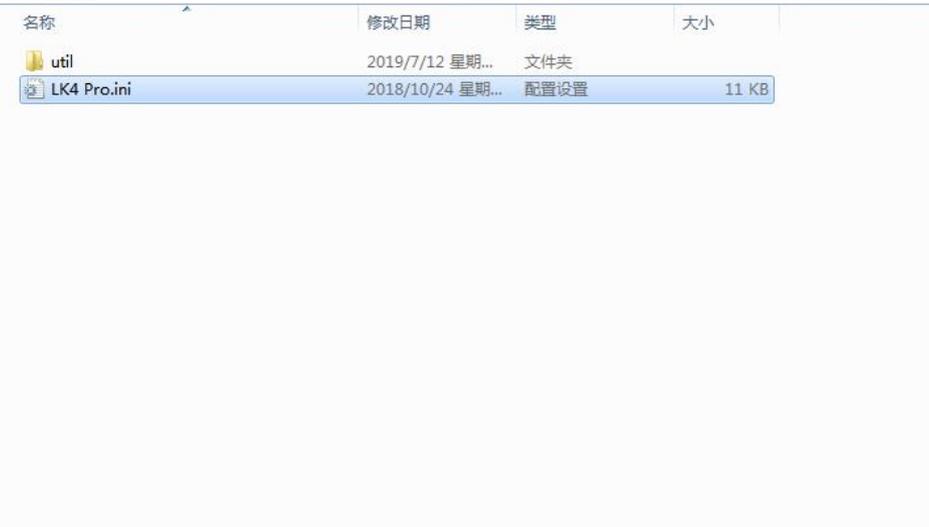
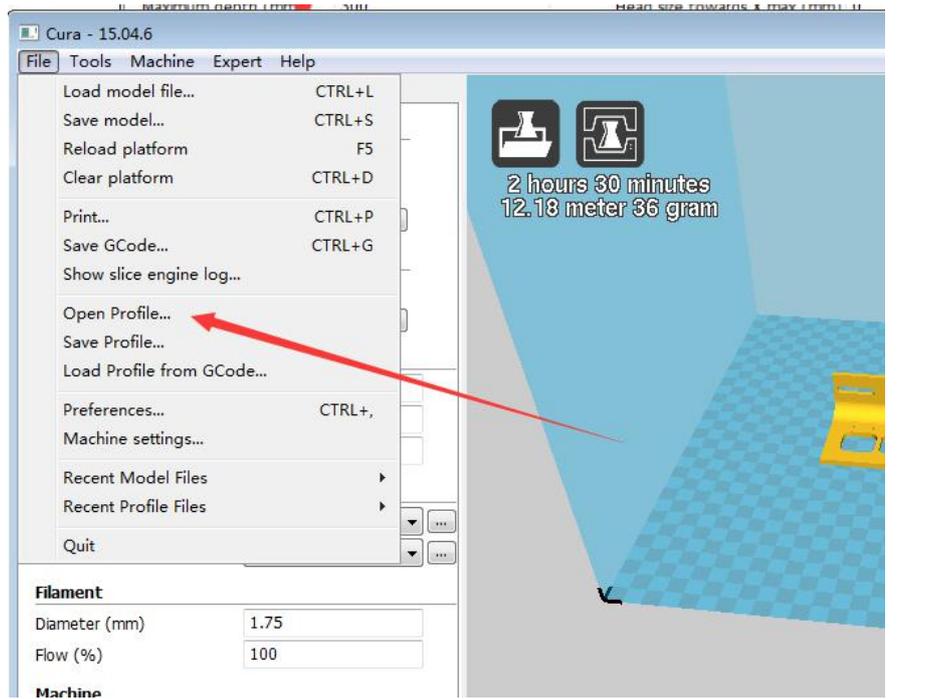


**Completing the Cura 15.04.3 Setup Wizard**

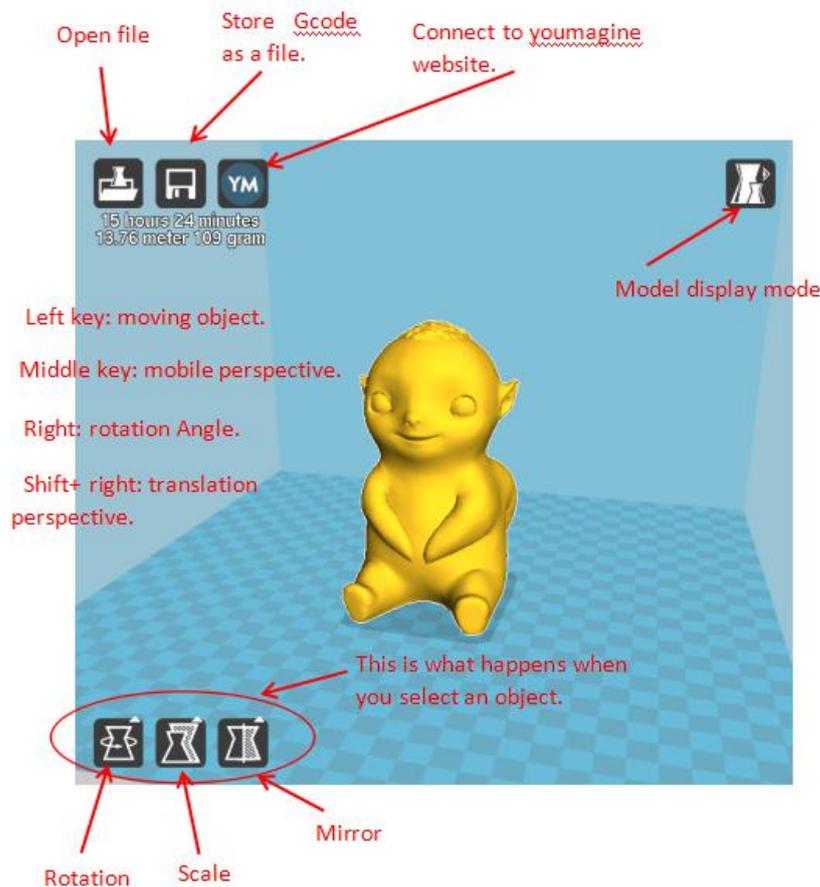
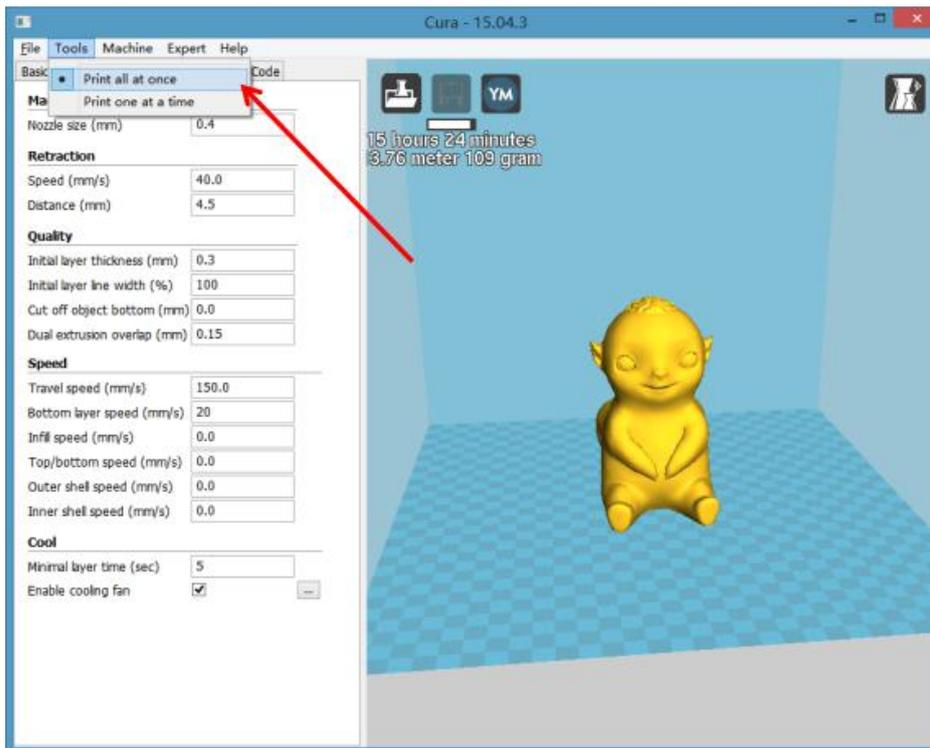
Cura 15.04.3 has been installed on your computer. Click Finish to close this wizard.

Start Cura 15.04.3

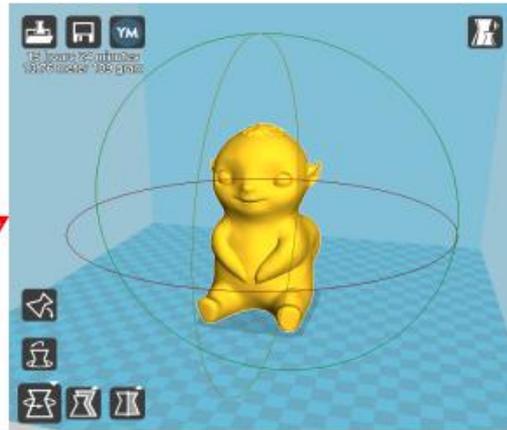




# (1) Slice software offline printing instructions



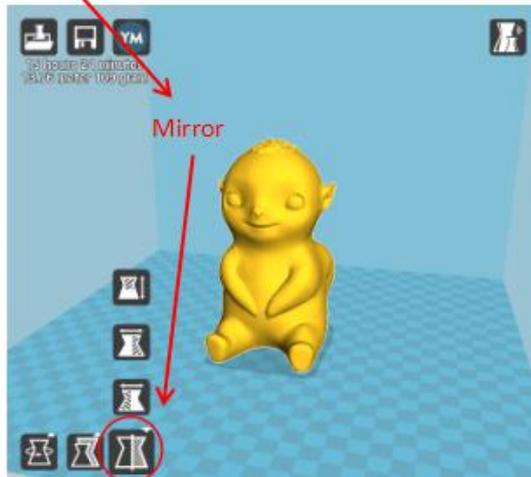
It works under Normal conditions.



1. Click on the rotating
2. Pull the rotation control circle, by default 15 degrees, hold shift and shake the control circle, you can rotate the unit by 1 degree.



Scale by size or scale

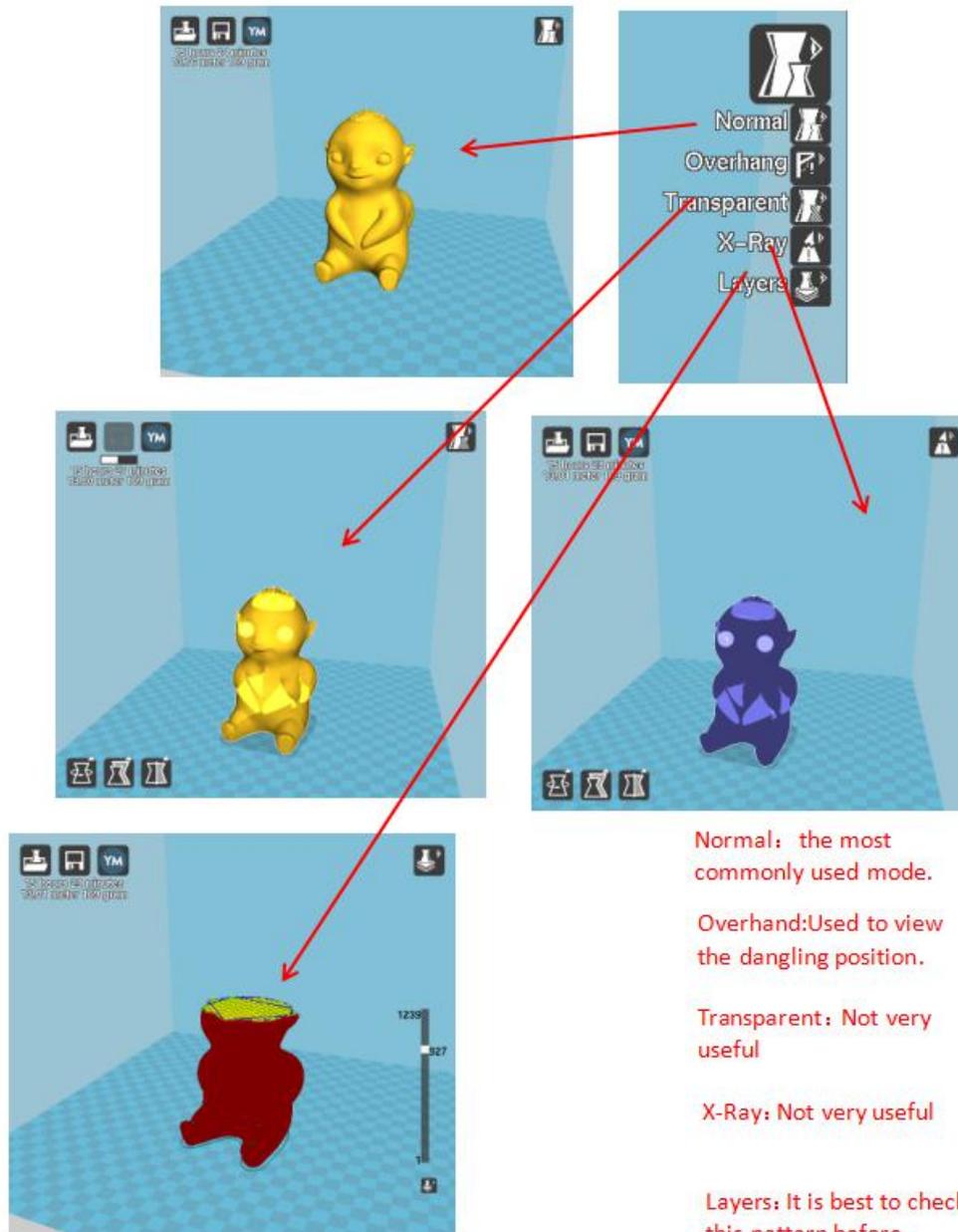


Mirror

Uniformly scaled size

The scale button

By "File" > Save "<filename>.gcode" (filename is a custom file name, the file name should not be too long). The file name must be English or numeric. It cannot be named as Chinese or special characters. The file must be saved on the SD card. Under the root directory. Save the sliced file to the SD card, insert it into the card slot, turn on the power, and print the steps. Select "Folder" in the main menu of the display, then select the "filename.gcode" file you just saved, and confirm the warm-up. And print



Normal: the most commonly used mode.

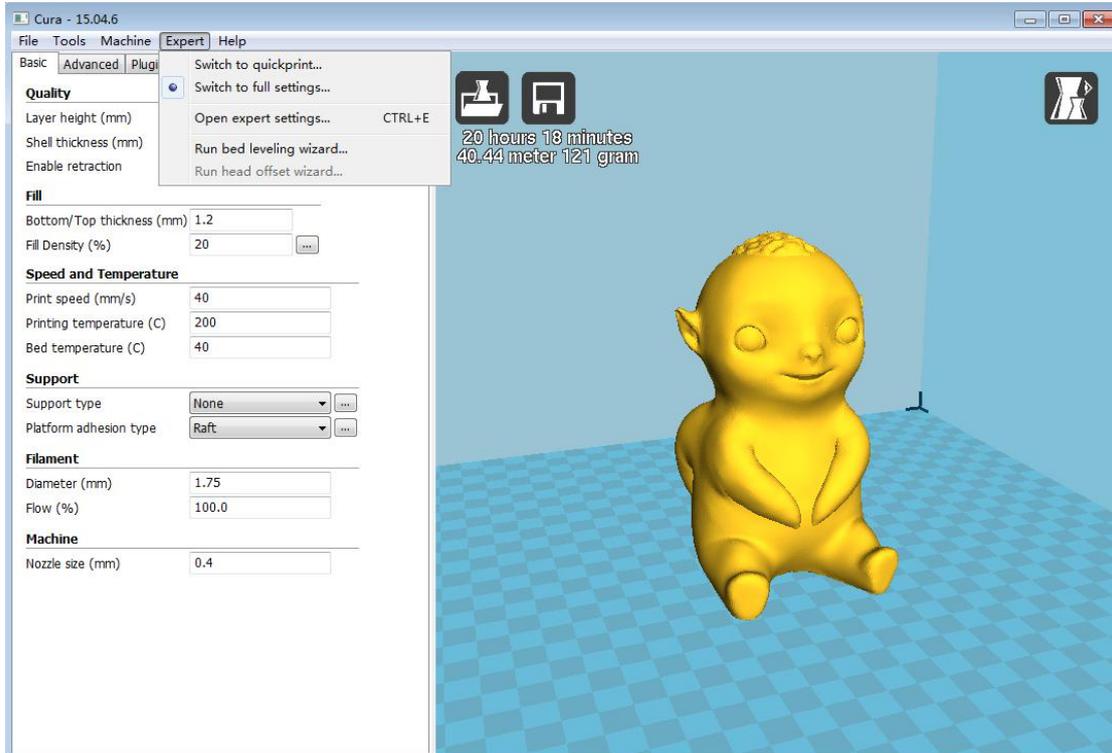
Overhang:Used to view the dangling position.

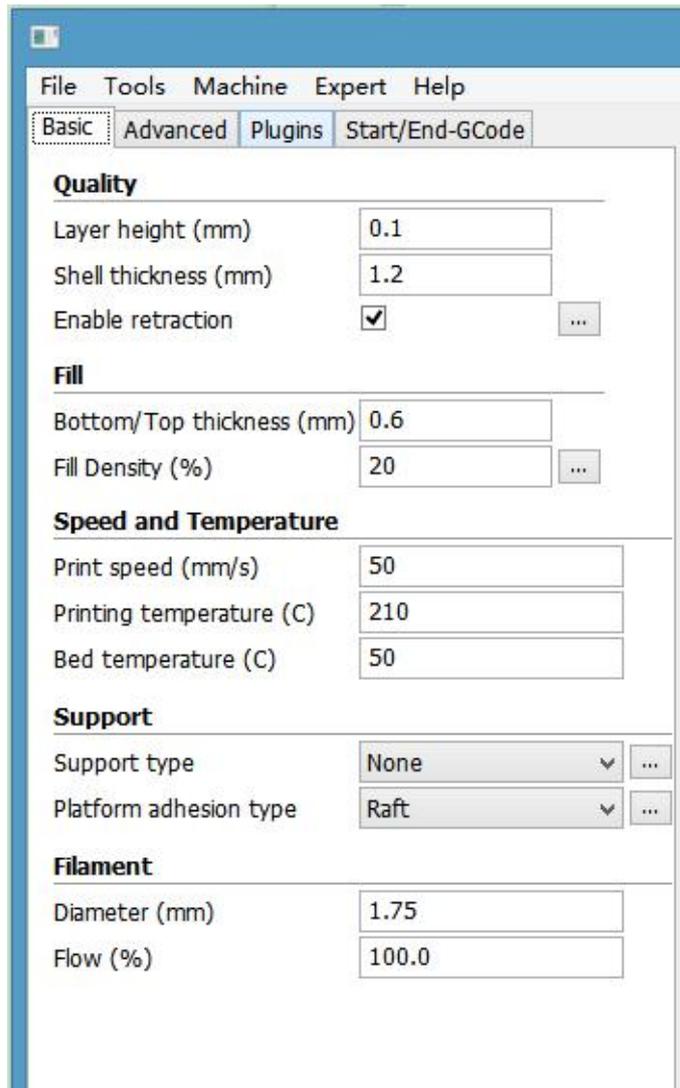
Transparent: Not very useful

X-Ray: Not very useful

Layers: It is best to check this pattern before printing to confirm that the pattern is sliced correctly.

## (2) Software parameter setting





**Layer thickness:** 0.1~0.4mm available. 0.1mm high precision but long printing time, 0.4mm low precision but printing time is too short, in general select 0.2mm.

Shell thickness: 0.4mm is very thin, in general select 1.2mm, that will increase printing time.

**Enable retraction:** To prevent the wire from leaking when printing quickly, otherwise it will affect the appearance.

**Bottom/Top thickness:** In order to make the top layer print more perfect and flat bottom layer.

**Fill density:** If the intensity is not high, select 20%. If the intensity is high, increase it and the printing time also will increase.

**Print speed:** Generally set 30-100, the print speed is higher and the precision is lower.

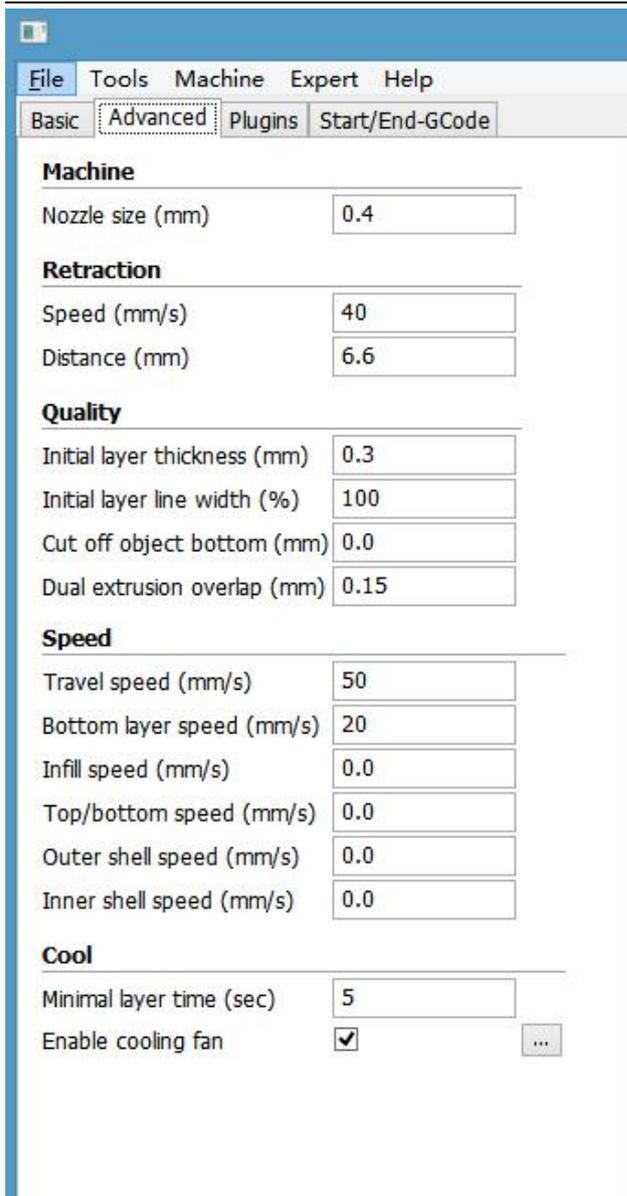
Printing temperature: Depends on the filament, generally select 190 ~ 210 degrees.

**Support type:** Include half-support and full support. In general the model with suspended structure needs to set support, but surface will be rough after removing support.

**Platform adhesion type:** "None" means do not set any support, "Brim" increases the bottom area. "Raft" base makes the model more adherent. To make the model better adhere to the base, add a base or edge. But best to increase a base and a edge relative to the small bottom area.

**Diameter:** 1.75mm

**Flow:** 100%



Section	Parameter	Value
Machine	Nozzle size (mm)	0.4
Retraction	Speed (mm/s)	40
	Distance (mm)	6.6
Quality	Initial layer thickness (mm)	0.3
	Initial layer line width (%)	100
	Cut off object bottom (mm)	0.0
	Dual extrusion overlap (mm)	0.15
Speed	Travel speed (mm/s)	50
	Bottom layer speed (mm/s)	20
	Infill speed (mm/s)	0.0
	Top/bottom speed (mm/s)	0.0
	Outer shell speed (mm/s)	0.0
	Inner shell speed (mm/s)	0.0
Cool	Minimal layer time (sec)	5
	Enable cooling fan	<input checked="" type="checkbox"/>

**Nozzle size:** 0.4mm.

**Retraction Speed:** The speed of retraction when printing.

**Retraction distance:** The length of material retraction, generally select 4.5~8mm.

**Initial layer thickness:** The first layer thickness of printing. Select default option.

**Initial layer line width:** 100% will be thicker and denser, Select default option.

**Cut off object bottom:** The length of cutting off the bottom of model.

**Dual extrusion overlap:** 0.15mm. Select default option.

**Travel speed:** The moving speed when nozzle does not extrude filament.

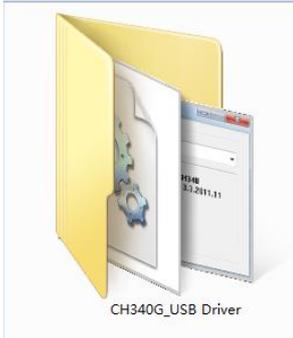
**Bottom layer speed:** The speed of printing the first layer. Setting a slower speed to make object better attached to base plate.

**Infill speed, Top / bottom speed, Outer shell speed, Inner Shell speed:** Select default option.

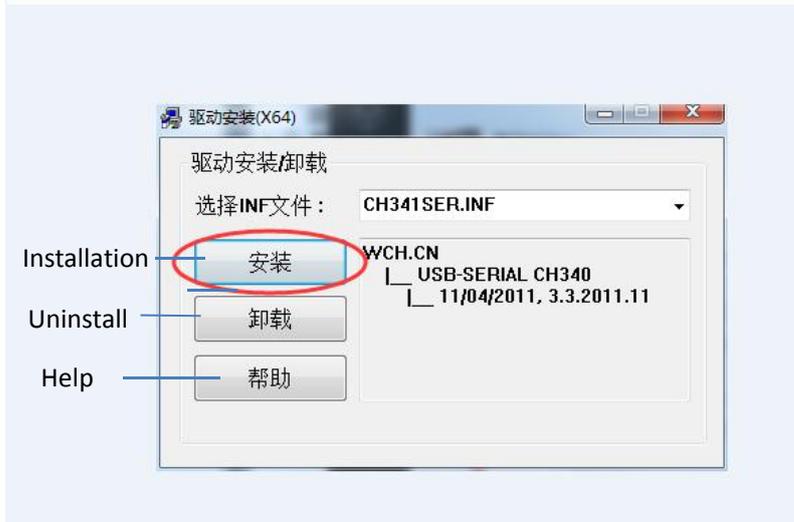
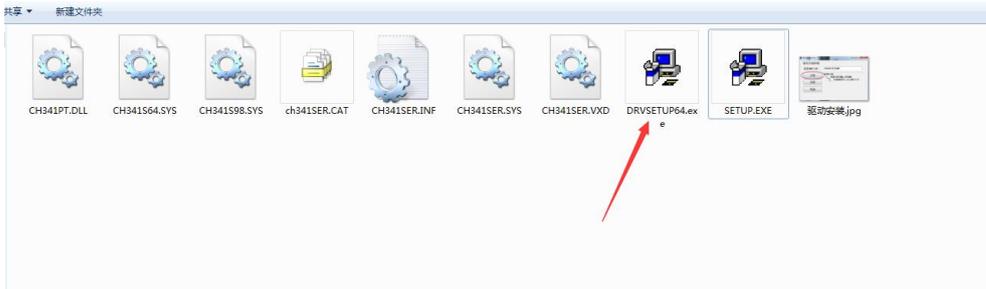
**Minimal layer time:** Select default option.

**Enable cooling fan:** To cool the temperature of nozzle.

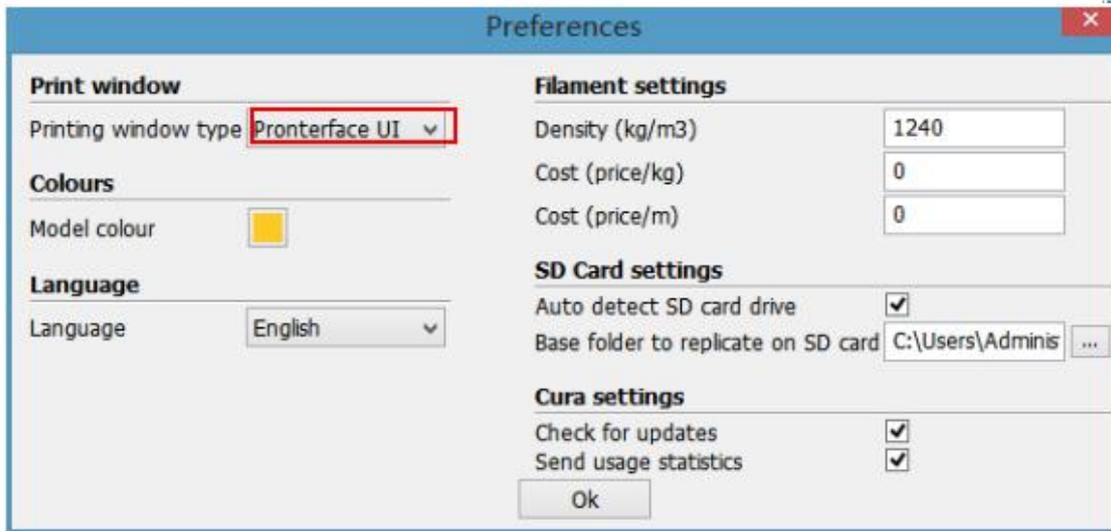
## D. Operation for online printing



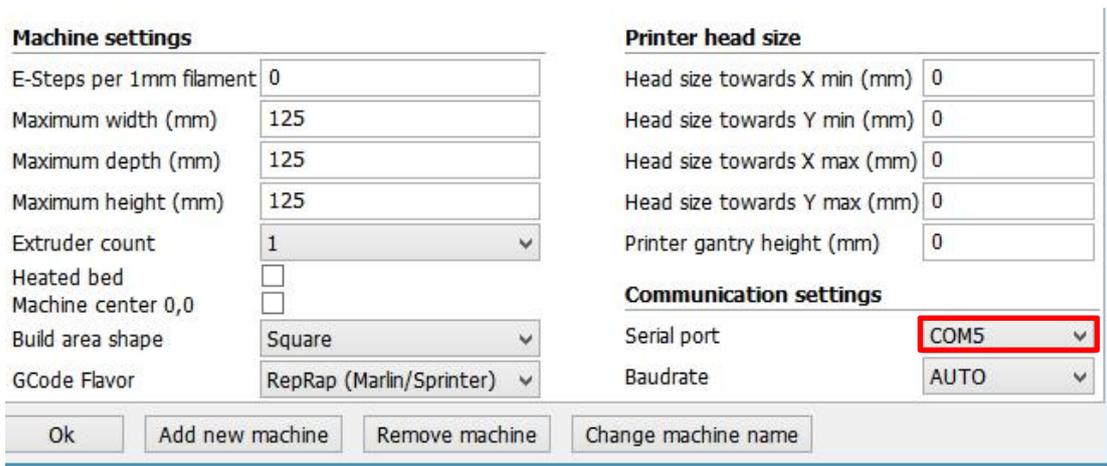
1. Power on the printer, connect USB to a computer, the driver will be installed automatically. If it doesn't install automatically, find the driver under the driver folder and install it manually.



2. Ctrl + ", opens the "Preferences" dialog.



3. Click on the menu "Model" "" Model Settings" to open

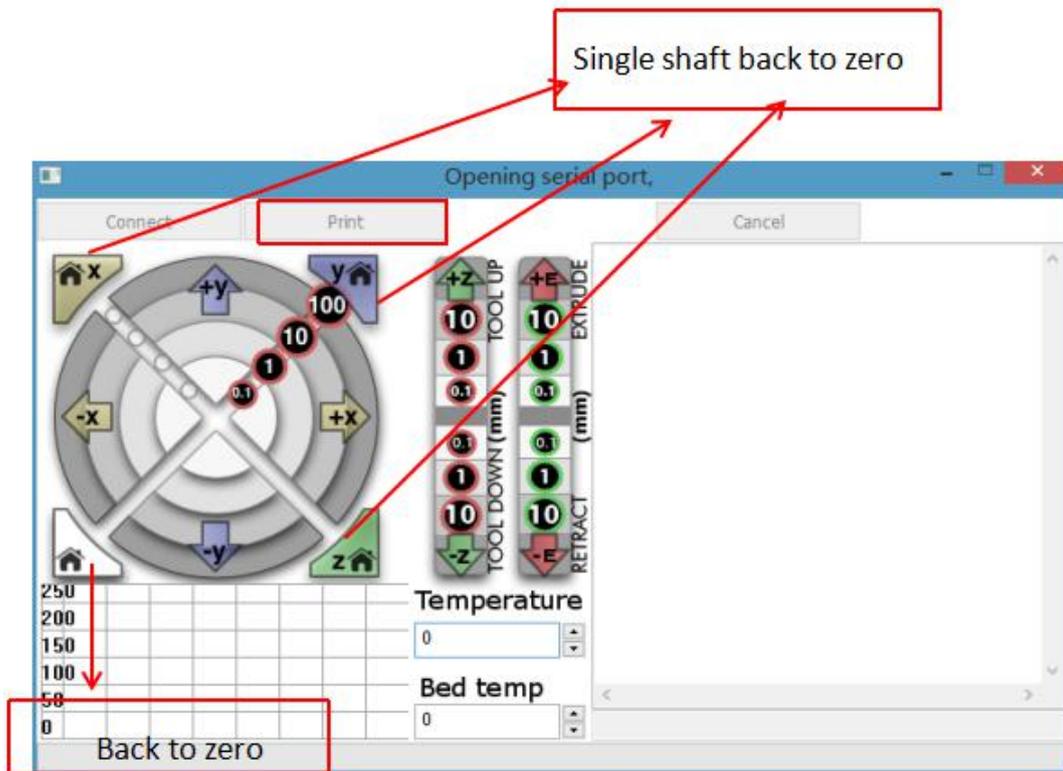


Select the corresponding serial port (different computer serial ports may be different, generally choose the larger one), the baud rate is "AUTO", click "OK".



Status shows that the connection has been

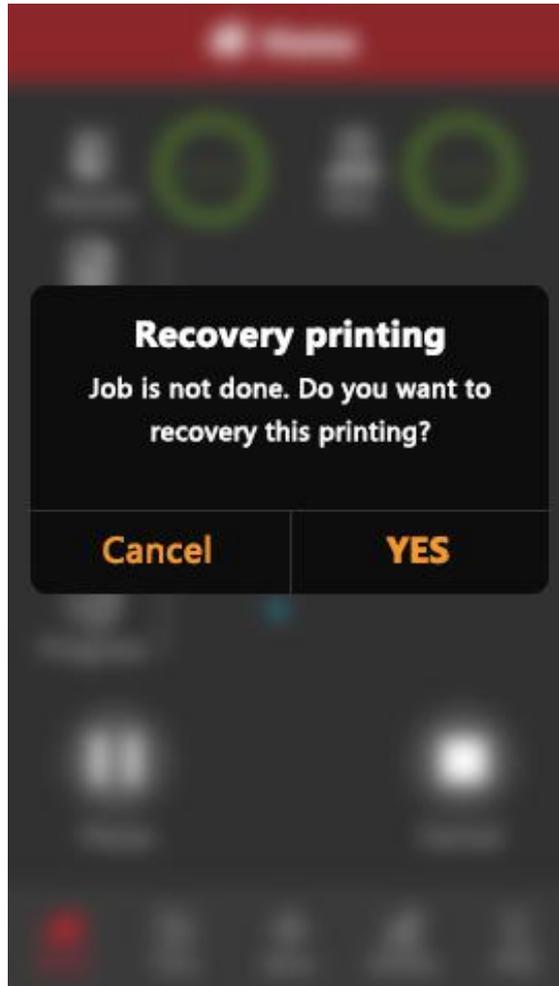
2. After loading a file, click the status icon above or "Ctrl+P" to start printing, and the print window will pop up.



We can click on the gray circle on the window to control the motion of the XYZE axis, respectively, 0.1, 10, 100 means the amount of each movement. The G-code control can be entered in the lower right corner text box. Do not use it if you don't understand it. Click "Print" to start printing. Please be careful during printing to avoid printing failure.

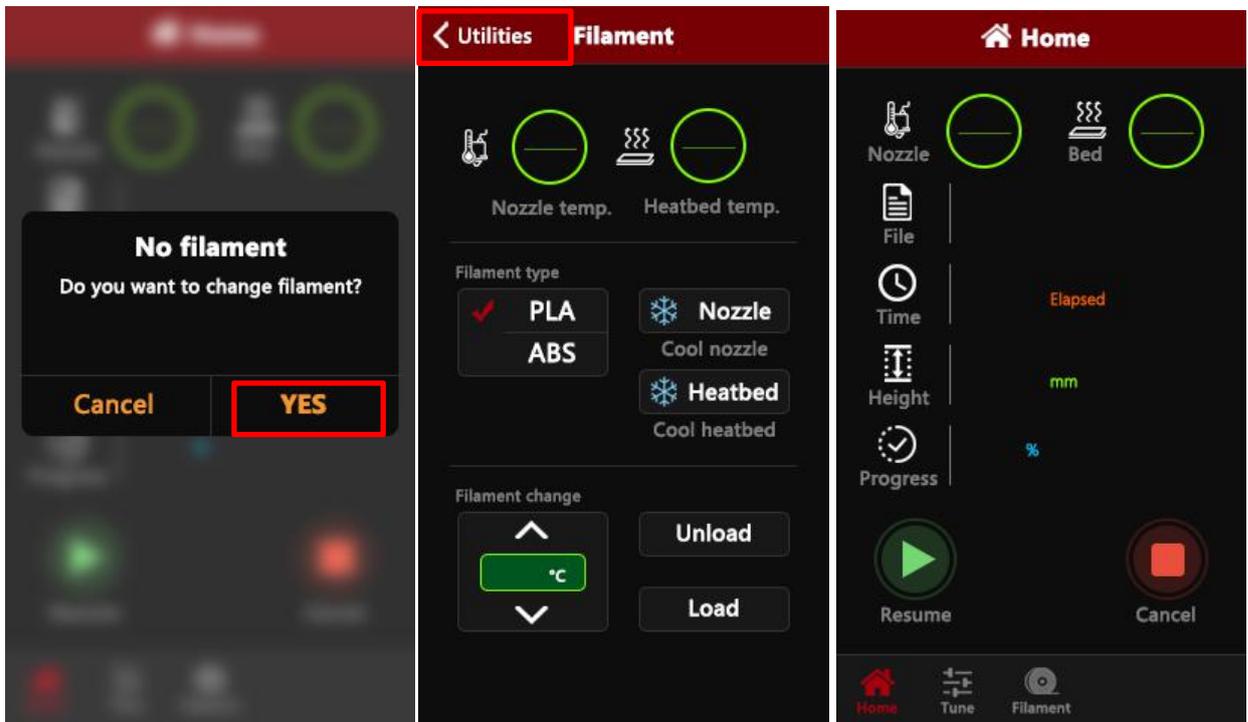
## E. Resume printing and filament run-out detection function

### (1) Power failure



When printing, the power is suddenly turned off. If the height of the printed model exceeds 0.1mm, the icon will be displayed when the power is turned on. Only the icon will be displayed once. After waiting for the temperature to rise, normal printing can be resumed

## (2) Broken material detection

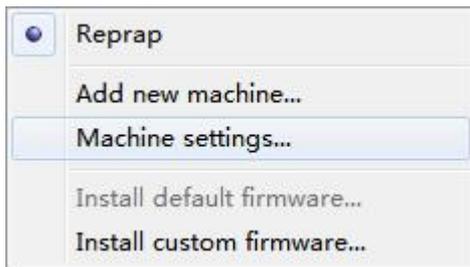


At this point, pull the Teflon tube out of the extruder end, take out the material, refill the consumables to the nozzle, click YES, after replacing the material, click Utilities, and finally click Print to start, the model will print.

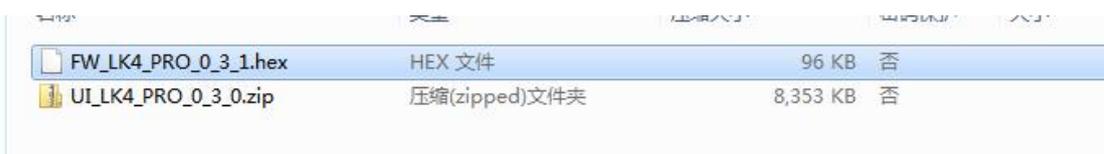
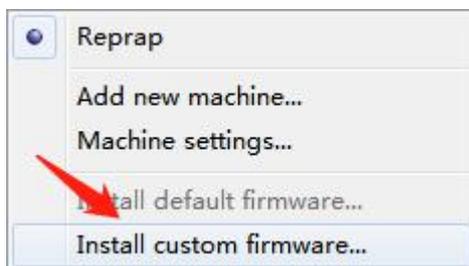
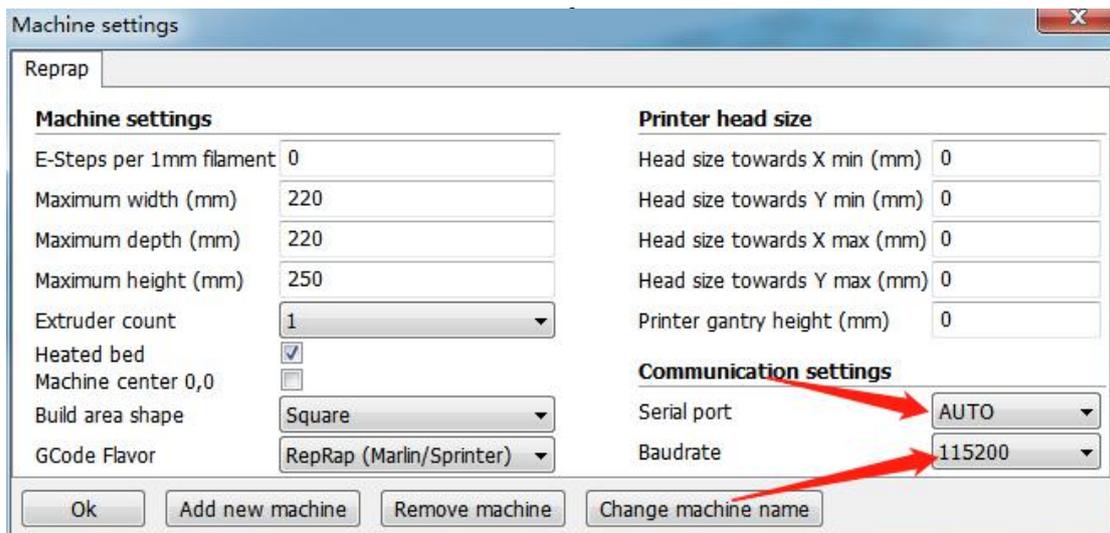
## F. FAQ manual

### Question1: How to update the firmware?

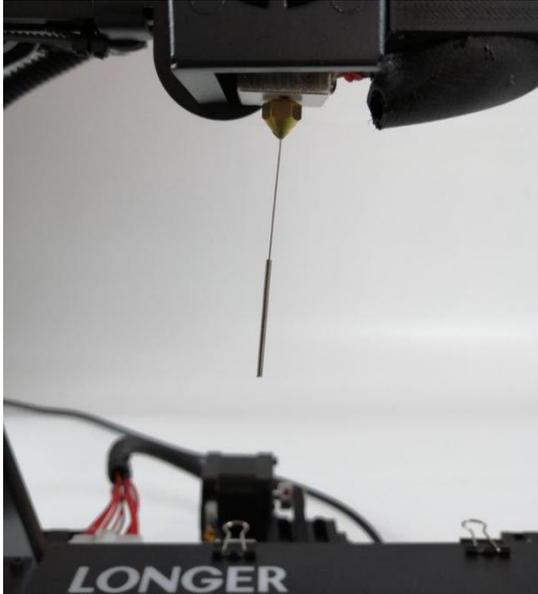
1. Connect the data cable to your computer and printer and open the cura15.04.3 version.



2. Click cura's machine setting, click baudrate, set to 115200.
3. Click on Install custom firmware in cura
4. Select the file FW\_LK4\_PRO\_0\_3\_1
5. Wait for the machine to update the



## Question 2: What if the filament does not discharge from the machine?



1. After the machine nozzle is heated, the consumables are normally fed into the feeding mechanism by hand, and then passed through the Teflon tube to enter the nozzle.
2. When it is found that the gear of the feeding mechanism emits a "beep" sound, it can first check whether the consumables are wound, causing the extrusion mechanism to pull the material.
- 3 If this is not the reason, raise the machine nozzle and use the 0.4mm needle in the toolbox to insert it from below the copper nozzle and rotate while inserting.
4. Under normal circumstances, this needle can be used to open the copper nozzle, so that the feed is smooth. The reason for this blocking is generally that there are impurities in the consumables, which leads to plugging.

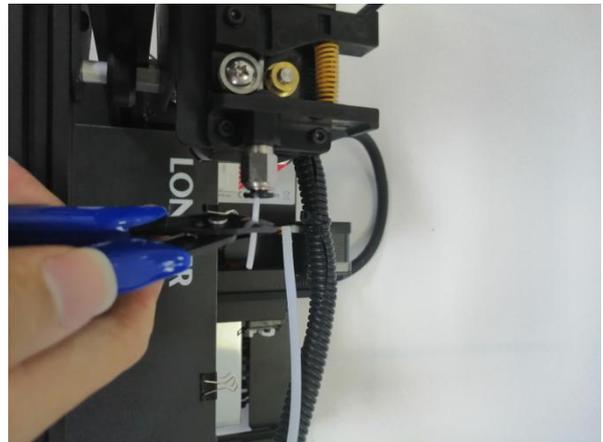
### Question 3:

When the machine returns the filament, it can't be returned. What should I do when stuck in the pneumatic joint?



1. Before returning the material, please heat the nozzle first, and then withdraw the consumables as soon as possible. If you can't pump it, you can re-feed the material with the advanced material, and melt the extruded block formed at the end of the consumable in the nozzle.

2. When withdrawing the consumables, before the end of the consumables reaches the pneumatic joint, we will usually pull the Teflon directly from the Teflon and cut the end of the consumables.



3. Because the end of the consumables in the nozzle will be deformed by heat, if the end deformed consumables are directly pulled out, it may be stuck to the pneumatic joint or the limit switch for damage detection. (The limit switch for the broken material detection is single. Towards).

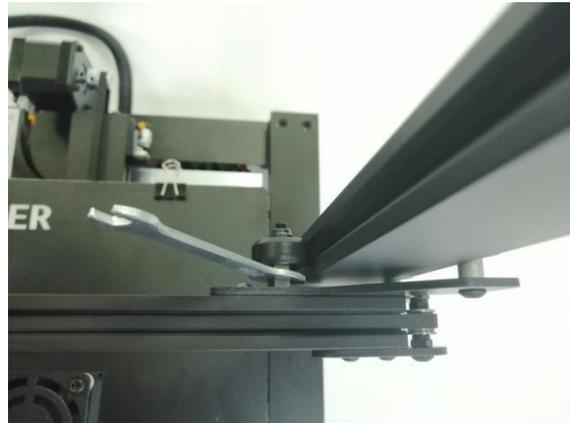
## Question 4: What should I do if I cannot resume printing after power shutdown?

If the power is suddenly turned off when the part is first printed, the machine will not save the print data. Unless the height of the print exceeds 0.5mm, the power failure will be supported. If the height is less than 0.5mm, it is recommended to reprint directly.

## Question 5:

When the machine is leveling, the nozzle moves to the left, it can be leveled normally. When the nozzle moves to the right, it is found that the distance between the nozzle and the heated bed are very far or very close. If the spring is adjusted to the extreme position, it still cannot be leveled. What should I do?

If this happens, the X-axis beam is generally loose. At this time, the hex socket on the right side of the machine can be adjusted with a wrench to adjust the tightness.



## Question 6:

After the machine heats up, the filament is discharged normally. However, when the printing is performed for the first time, the curling occurs on the platform. After printing several layers, the filaments get out of the platform. What can I do

1. After the user gets the 3D printer, if the leveling is found to be curled on the first layer of silk, it feels like it is gently falling on the platform. It can be judged that the leveling is not adjusted, and the nozzle is too high from the hot bed. ,
2. At this point we need to re-level, the quality of the leveling can largely determine the success rate of the part printing.
3. In addition, in order to ensure good contact between the model and the platform, we can set the larger plane of the model face down when slicing, and can also be set in the slicing software to add Raft to the model, which can make the model stick to the platform. Firm.