

# KOSSEL

 User Manual



Thank you for choosing **ANYCUBIC** products!



Please read the user manual carefully.



Please visit [www.anycubic3d.com](http://www.anycubic3d.com) for more information.



Email us on [support@anycubic3d.com](mailto:support@anycubic3d.com) or [james@anycubic3d.com](mailto:james@anycubic3d.com) for technical support.  
We are likely to solve any question you might have.



**ANYCUBIC** Website



Facebook account



YouTube channel



Team **ANYCUBIC**

# Safety instruction



**ANYCUBIC** 3D printer generates high temperature. Do not reach inside of the printer during operation. Allow time for the printer to cool down after printing. Contact with extruded materials may cause burns. Wait for printed objects to cool before removing them from the build platform.



**ANYCUBIC** 3D printer includes moving parts that can cause injury.



Vapors or fumes may be irritating at operating temperature. Always use the **ANYCUBIC** 3D printer in an open, well ventilated area.



Be cautious when using the scraper. Never direct the scraper towards your hand.



**ANYCUBIC** 3D printer must not be exposed to water or rain.



**ANYCUBIC** 3D printer is designed to be used within ambient temperature ranging 8°C-40°C, and humidity ranging 20%-50%. Working outside those limits may result in low quality printing.



It is recommended to use protection glasses when cleaning/sanding the printed models to avoid small particles contacting eyes.



In case of emergency, immediately turn off the **ANYCUBIC** 3D printer and contact us or consult for professional advice. Never leave the **ANYCUBIC** 3D printer unattended during operation.



# Technical Specification

## Printing

Technology: FDM (Fused Deposition Modeling)  
Build Size: (Linear Plus) Ø230 x 300mm  
(Pulley) Ø180×300 mm  
Print accuracy: 0.1-0.4 mm  
Positioning Accuracy: X/Y 0.0125mm , Z 0.0025mm  
Extruder Quantity: Single  
Nozzle Diameter: 0.4 mm  
Print Speed: 20~60mm/s  
Travel Speed: 60mm/s  
Supported Materials: PLA, ABS, HIPS, Wood

## Temperature

Ambient Operating Temperature : 8°C - 40°C  
Operational Extruder Temperature : max 260°C  
Operational Print Bed Temperature : 100°C

## Software

Slicer Software : Cura  
Software Input Formats : .STL, .OBJ, .AMF  
Software Output Formats : GCODE  
Connectivity : SD card; USB port

## Electrical

Input rating : 110V/220V AC, 50/60Hz

## Physical Dimensions

Printer Dimensions:

(Linear Plus) 380mm(Δ) × 680mm(Height)

(Pulley) 315mm(Δ) × 680mm(Height)

Net Weight: (Linear Plus) ~7kg

(Pulley) ~5.8kg

# Contents

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## Installation section

1. Kossel 3D printer is divided into Linear Plus and Pulley version. Please follow the specific version for assembly **step by step (S1-S7)**.
2. It is suggested to use a flat desktop and place the parts in an orderly manner for quick assembly.
3. Each step has a list of required parts, assembly diagram and tips. Please read the installation techniques and precautions before assembly.
4. The real color and size of some parts may be different from that in the manual, but the assembly method is the same.
5. Firmware has been uploaded to the motherboard in factory. After completing the assembly, please level the platform and load the filament then you could start the first test print.

# Overview (front)

Limit switch  
Linear slider

**Left**

carbon fiber tube

Print head

Nozzle

Power supply

Power switch

Belt connector

**Right**

Feed pipe

Feed pipe connector

Model cooling fan

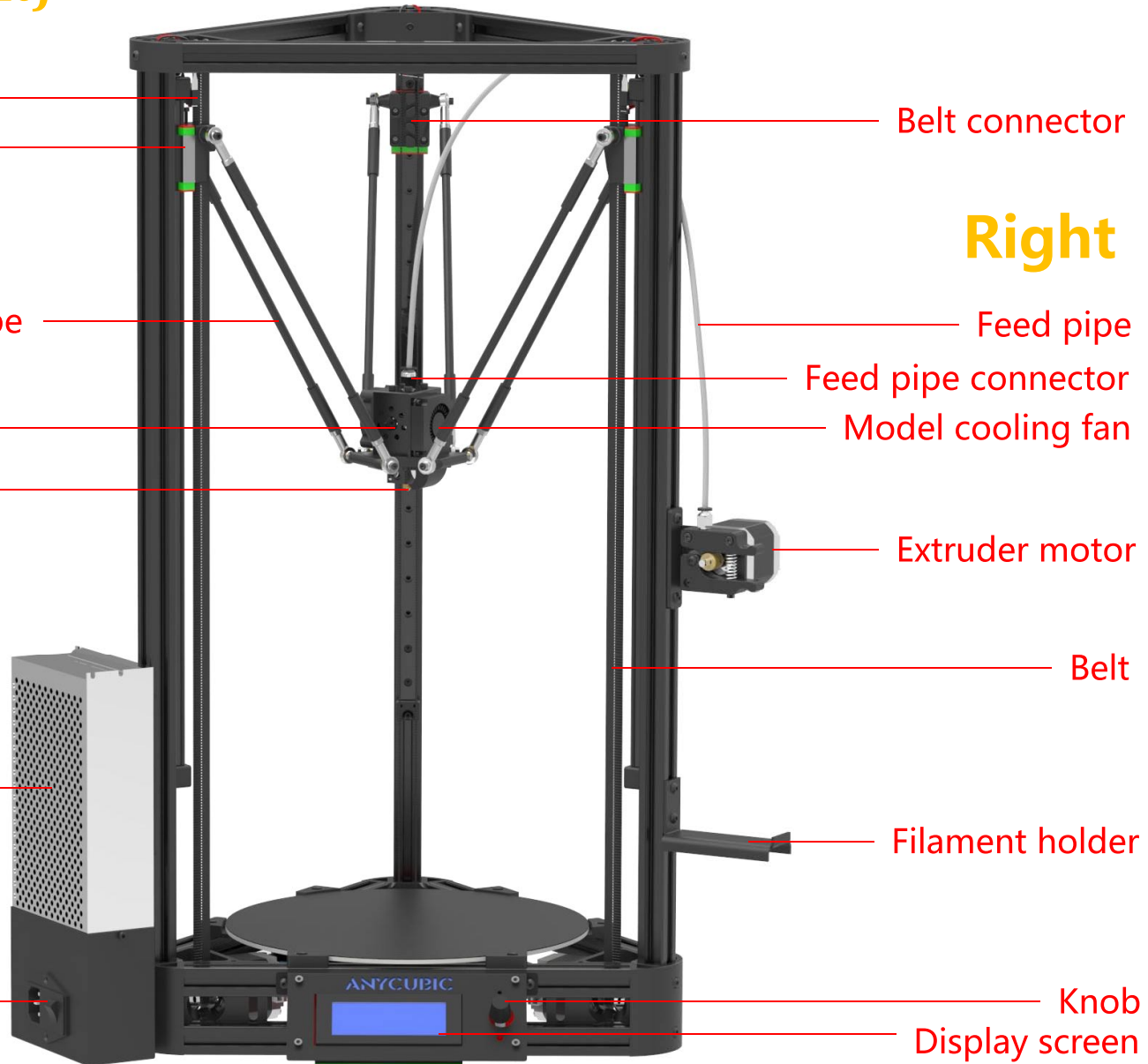
Extruder motor

Belt

Filament holder

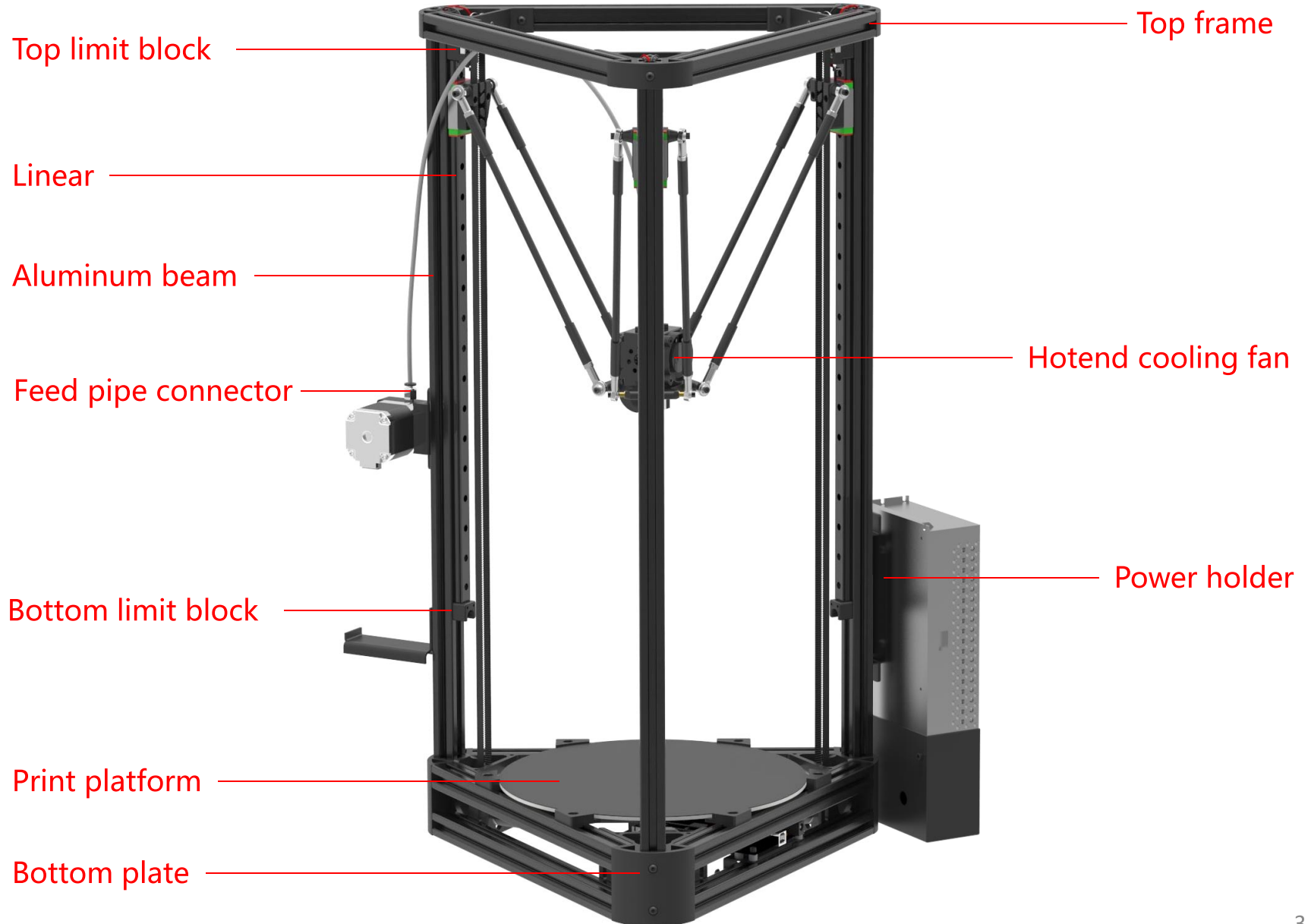
Knob

Display screen



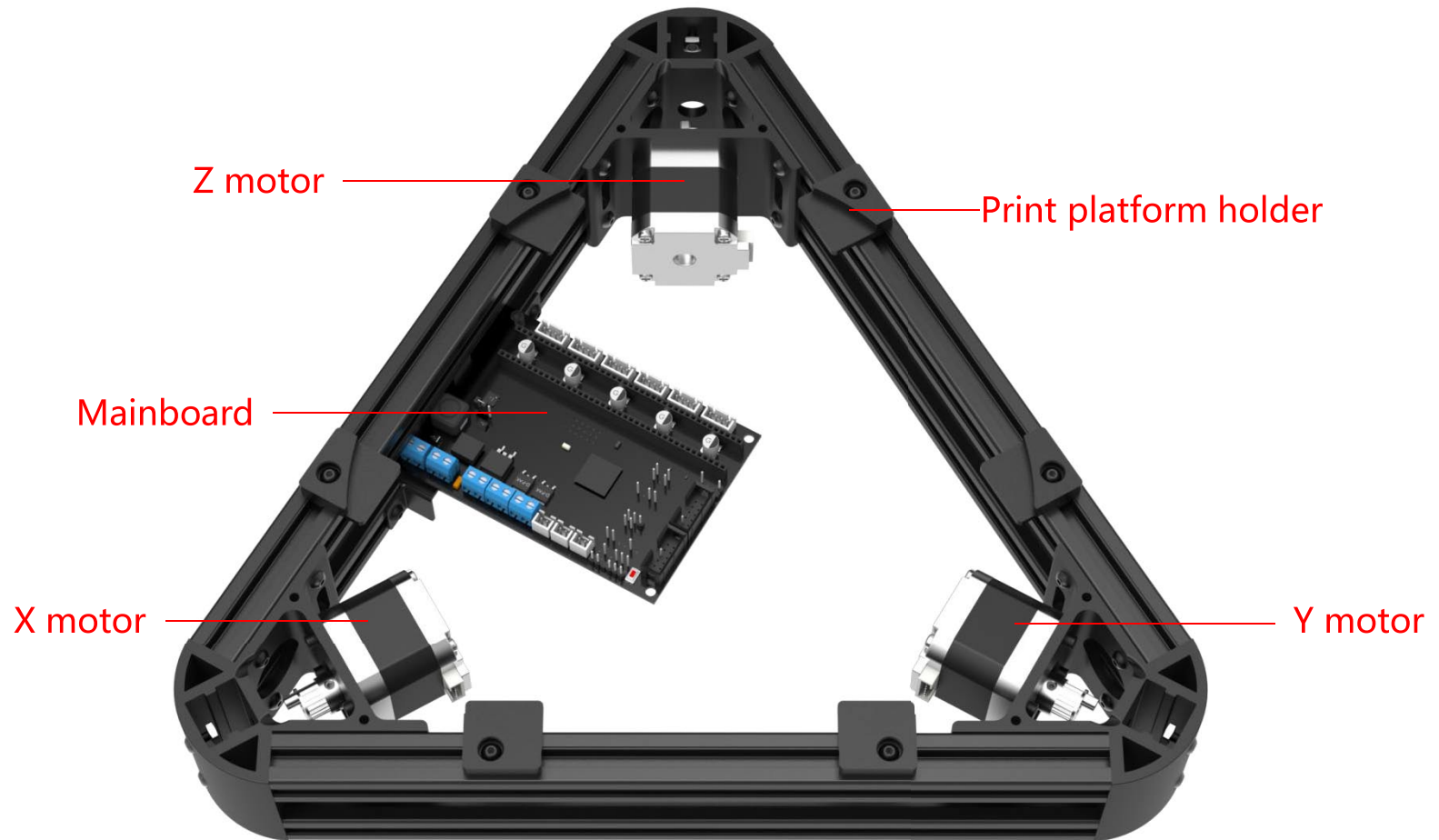
Linear version for example

# Overview (rear)



Linear version for example





## Overview (bottom frame)



# S1 Linear Plus/Pulley




**ANYCUBIC Kossel 3D printer has two versions: Linear Plus, and Pulley. Please follow the correct models for assembly and set-up.**

## Linear Plus list

	
Bottom frame 1PCS	Parts pack 1PCS
	
Aluminum beam 3PCS	
	
Linear Plus 3PCS	

Start from Page 6

## Pulley list

	
Bottom frame 1PCS	Pulley 3PCS
	
Aluminum beam 3PCS	

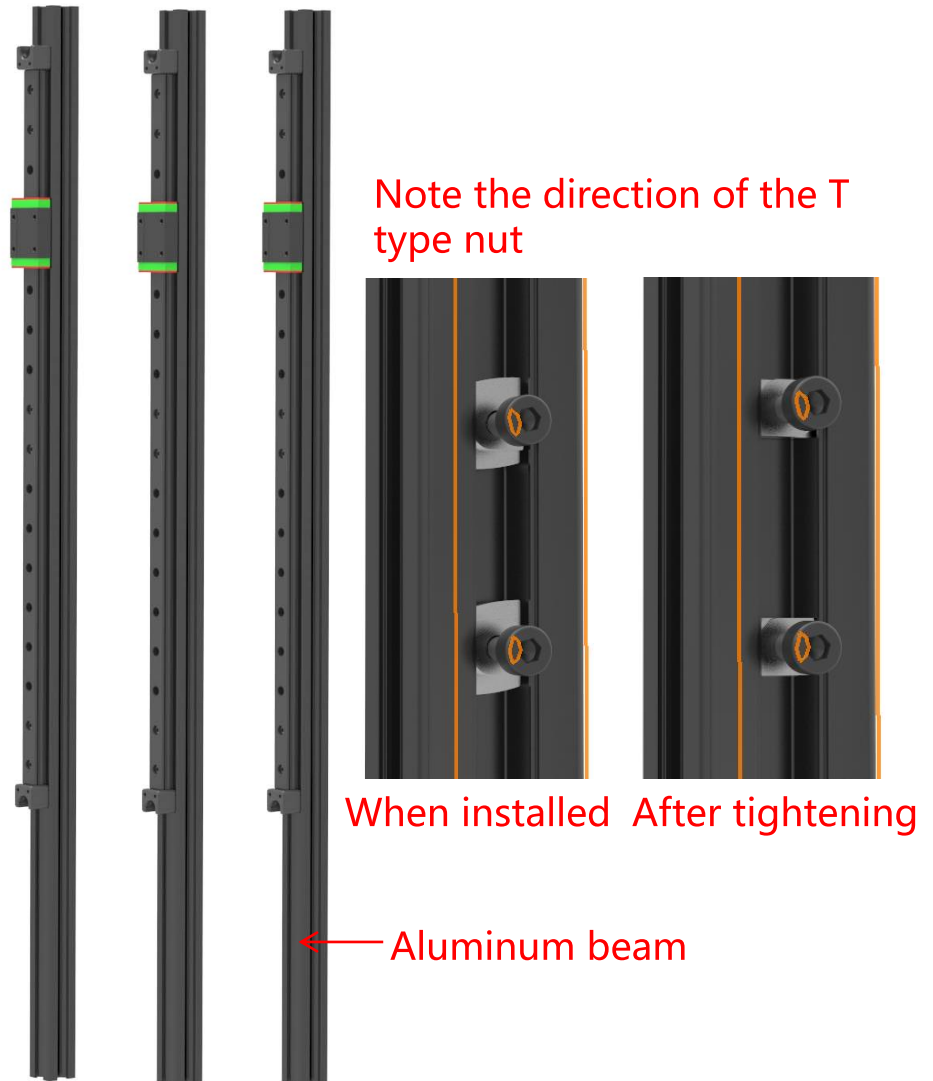
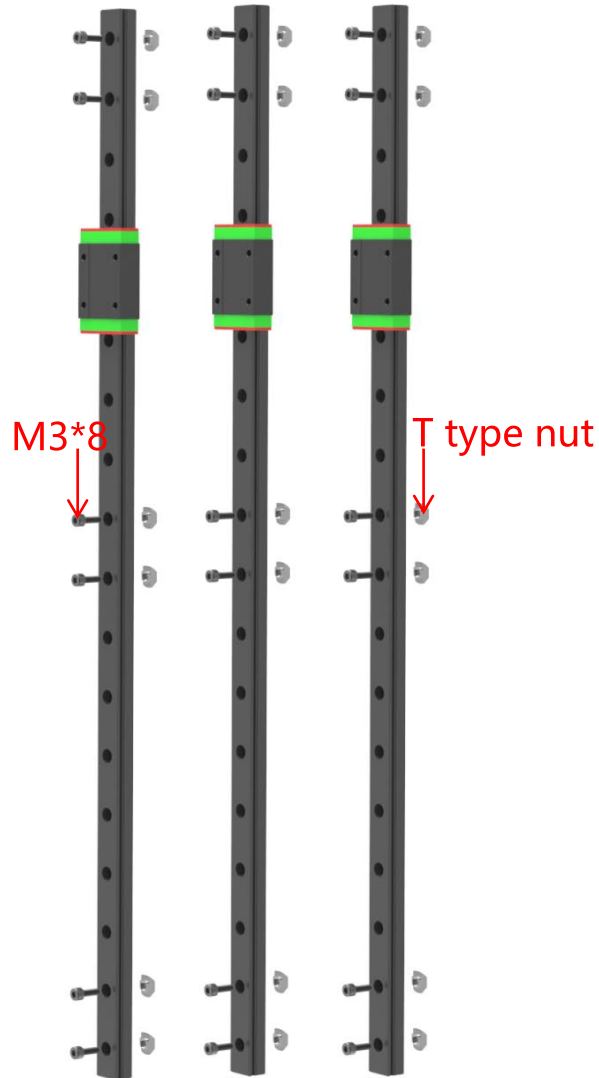
Start from Page 8

# S1 Linear Plus/Pulley

## Linear Plus ( The user of the Pulley should start from page 8 )

① As shown below, pre-install screws and T-nuts on three linear rails with equal interval. Do not tighten the screws now.

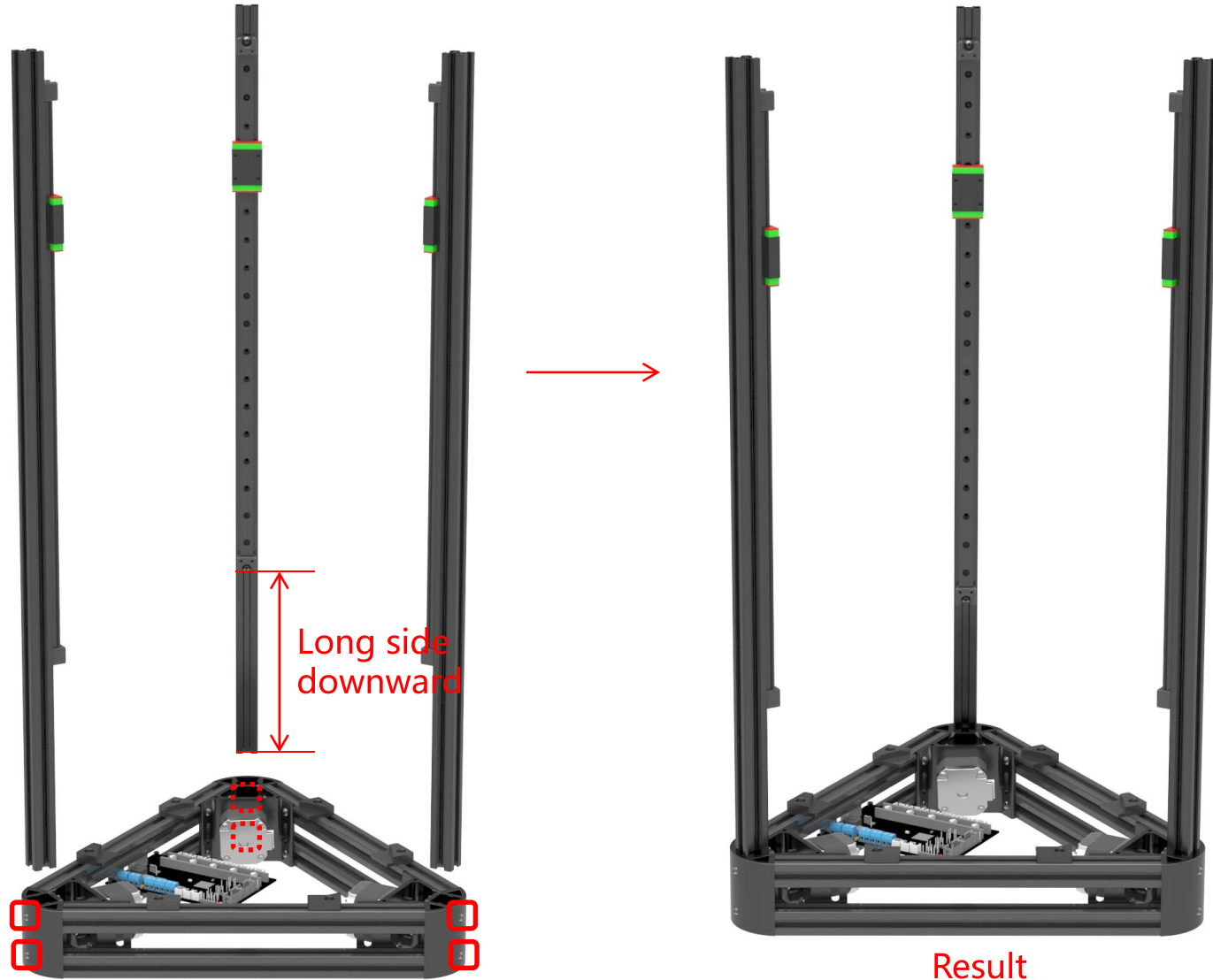
② Install the linear rails on three aluminum beams respectively and then tighten the screws and T nuts.





# S1 Linear Plus/Pulley

③ Insert the aluminum beams into the holes of bottom frame, please pay attention to the direction. Lastly tighten the six screws indicated by red squares. Users may have to adjust the tightness of those screws when install the top frame.



# S1 Linear Plus/Pulley

## Pulley ( **Linear Plus version users should skip here, directly go to S2** )

① Slide three pulleys into the aluminum beams from the end without the limit block ( Note that the limit block and pulley are at the same end ).



② Insert the aluminum beam into the hole of the bottom frame and tighten those six screws in the bottom frame (red squares). Users may have to adjust the tightness of those screws when install the top frame later.



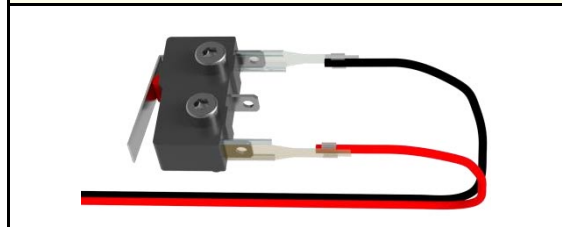
# S2 End stop

The assembly methods for both Linear Plus and Pulley are the same from S2-S7. We take Linear Plus version as an example.

List



Top frame 1PCS



End stop 3PCS



Parts pack 1PCS

Result



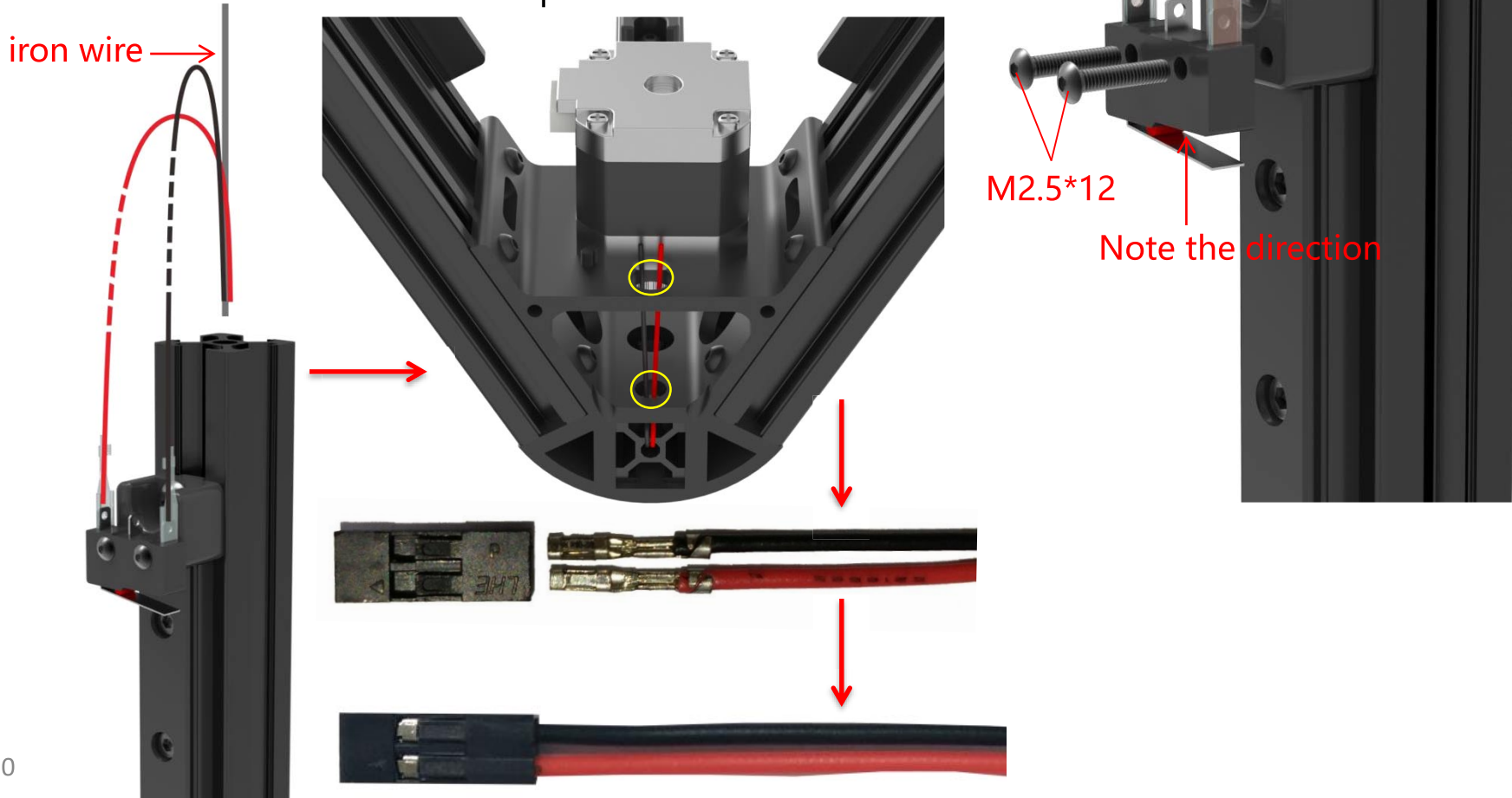
Linear Plus version



Pulley version

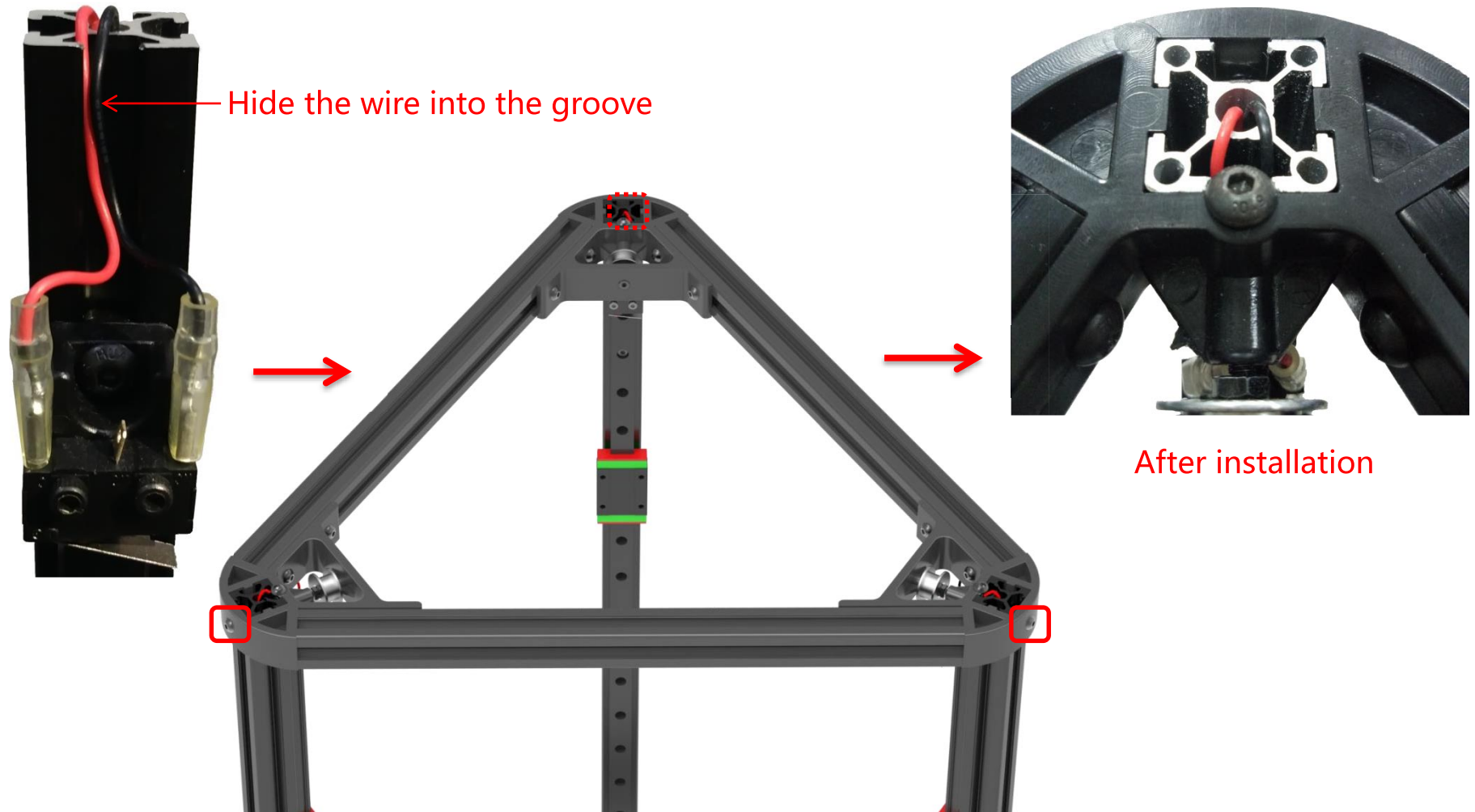
## S2 End stop

- ① Use the M2.5 \* 12 screws to secure the three end stops to the top limit block. Note the direction of the limit switch.
- ② Tie the red and black wires of end stop together with a thin iron wire, pass them through the center hole of the aluminum beam, then through the holes on bottom frame (yellow circled). Finally, install the plastic terminals to the end of the wires (no positive and negative). Do the same to the other two end stops.



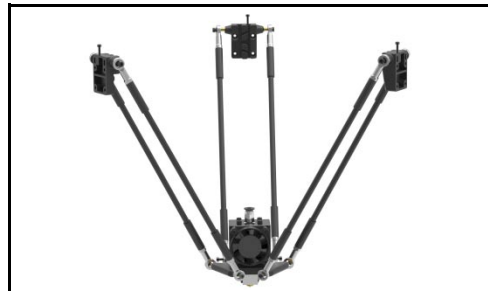
## S2 End stop

③ Straighten the end stop wires along with the center holes of aluminum profile, and then install the top frame onto the aluminum beam. ***Be careful do not damage the end stop wire.*** After level the top of the aluminum beam with the top frame, tighten the three screws as the red squares indicated.



# S3 Print head, Belt

List



Print head 1PCS

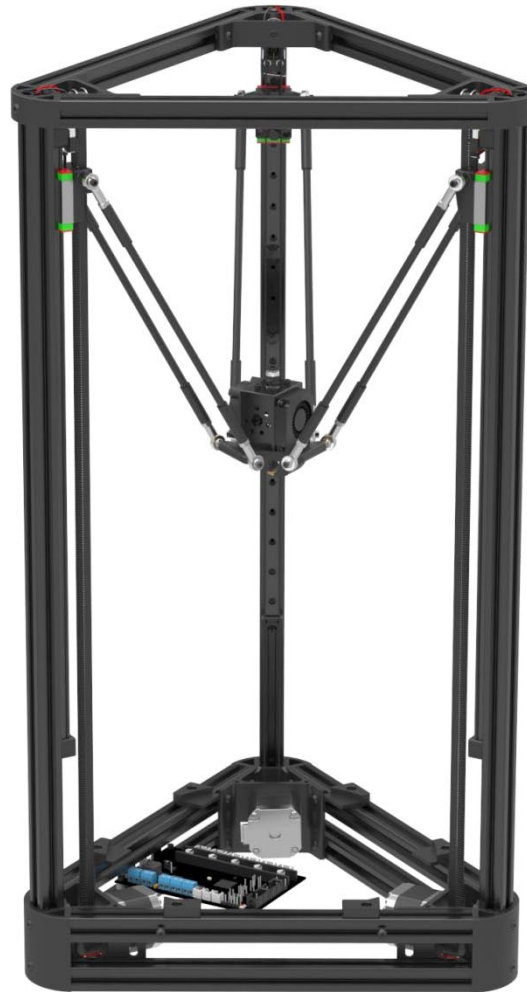


Belt



Parts pack 1PCS

Result



Linear Plus version

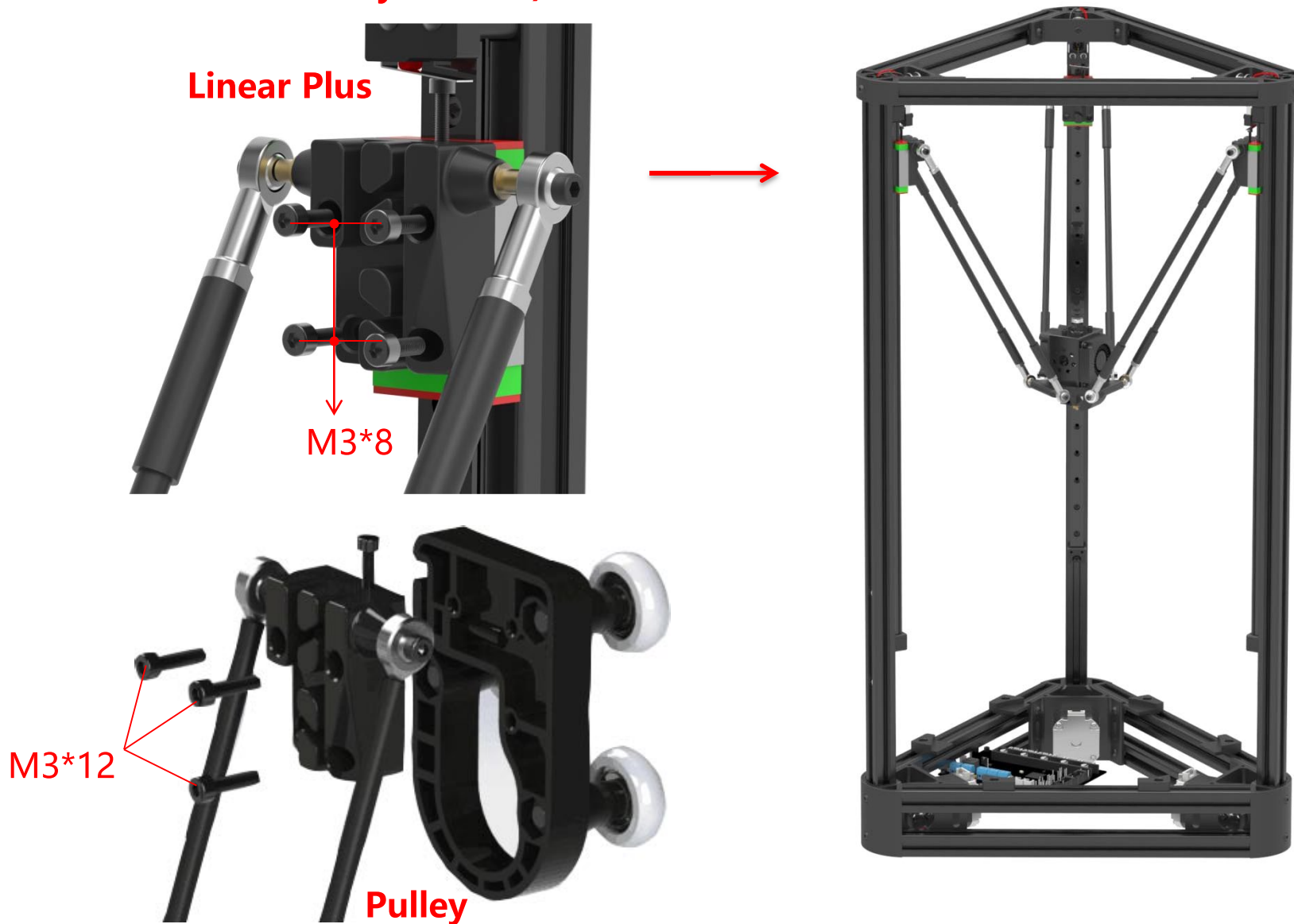


Pulley version



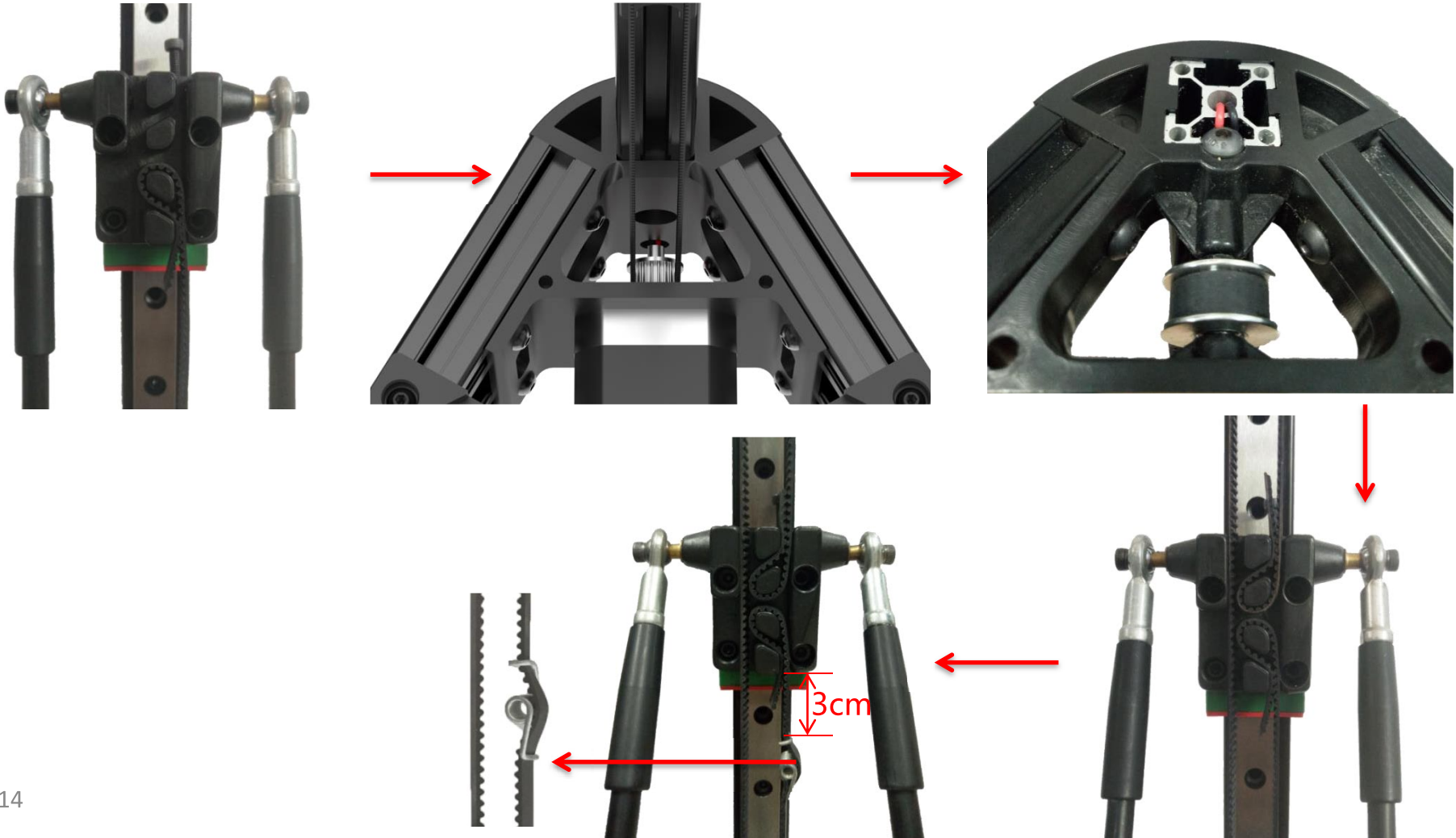
# S3 Print head, Belt

① Secure the belt connectors to the Linear Plus slider with M3 \* 8 screws ( **Please use M3 \* 12 screws here for the Pulley version** ) .



## S3 Print head, Belt



② As shown below, first secure one end of the belt onto the belt connector, then pass through the synchronous wheels on the motor in the bottom frame, and then pass the idle wheel on the top. Lastly, fasten the other end of belt onto the belt tensioner. After that, cut off the extra, and in order to fasten the belt better, users may use the pliers to install the tension spring 3-cm below the belt connector.





# S4 Display screen

List


Display 1PCS

Parts pack 1PCS

Result



Linear Plus version

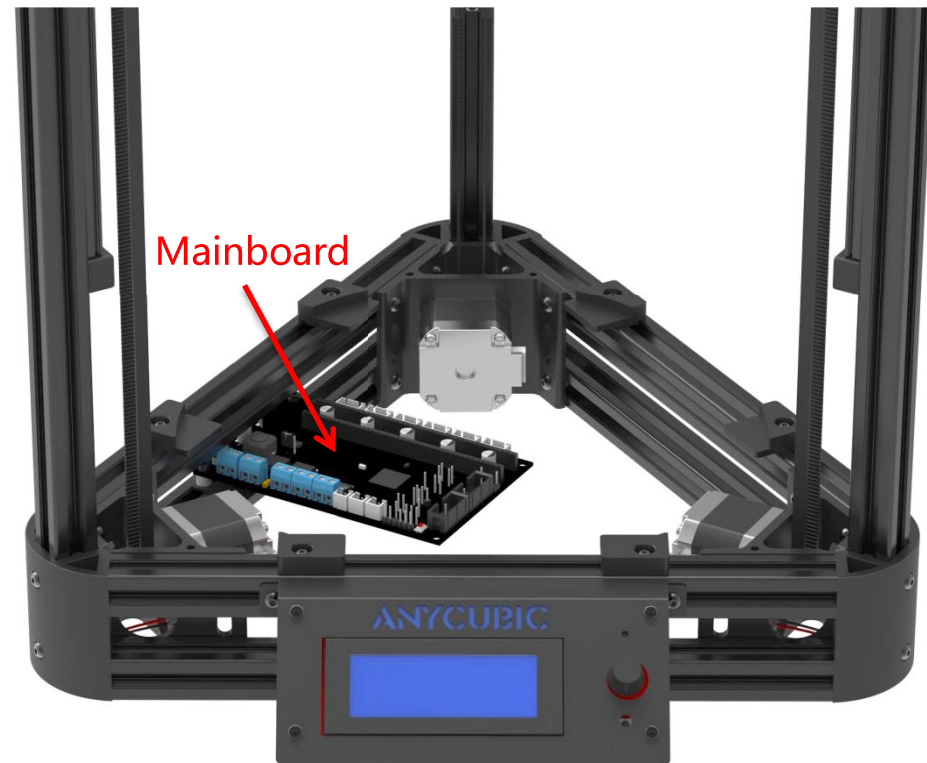


Pulley version

# S4 Display screen

① Pre-installed screws  
(Do not tighten now).

② Install the display in the middle of the bottom frame aluminum beam *(Note the relative position of the display and the mainboard).*



# S5 Filament holder, Extruder motor

List



Filament holder 1PCS



Feed pipe 1PCS



Extruder motor 1PCS



Parts pack 1PCS

Result



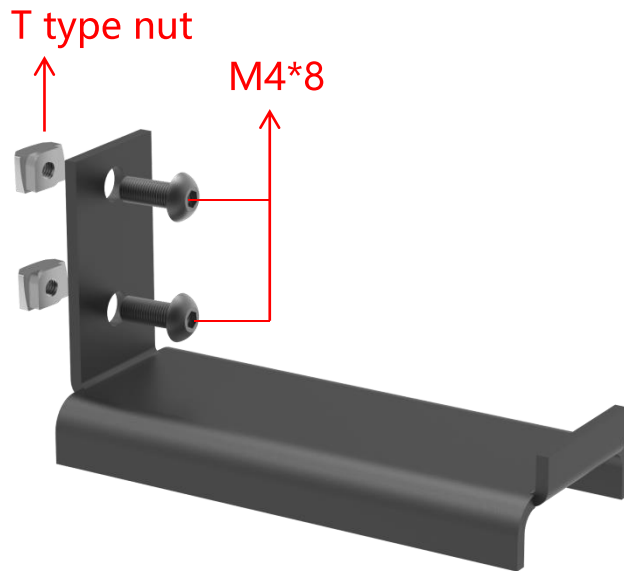
Linear Plus version



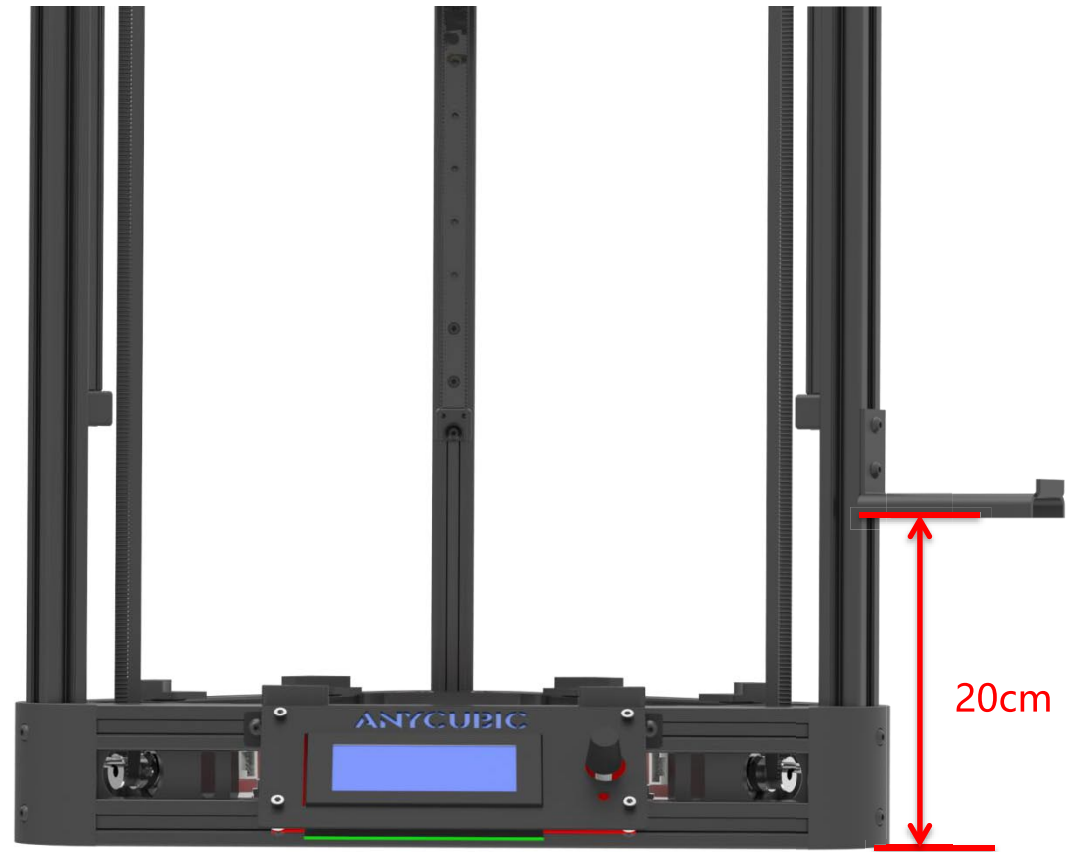
Pulley version

## S5 Filament holder, Extruder motor

① Pre-installed screws.  
(Do not tighten now).

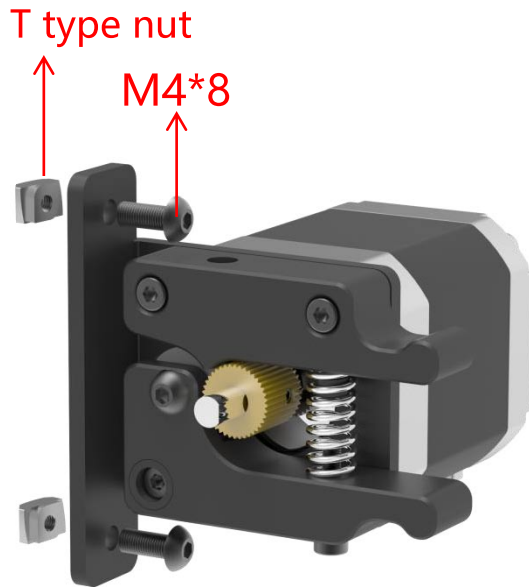


② Install the filament holder on the right side of the aluminum beam at 20cm height from the bottom frame.

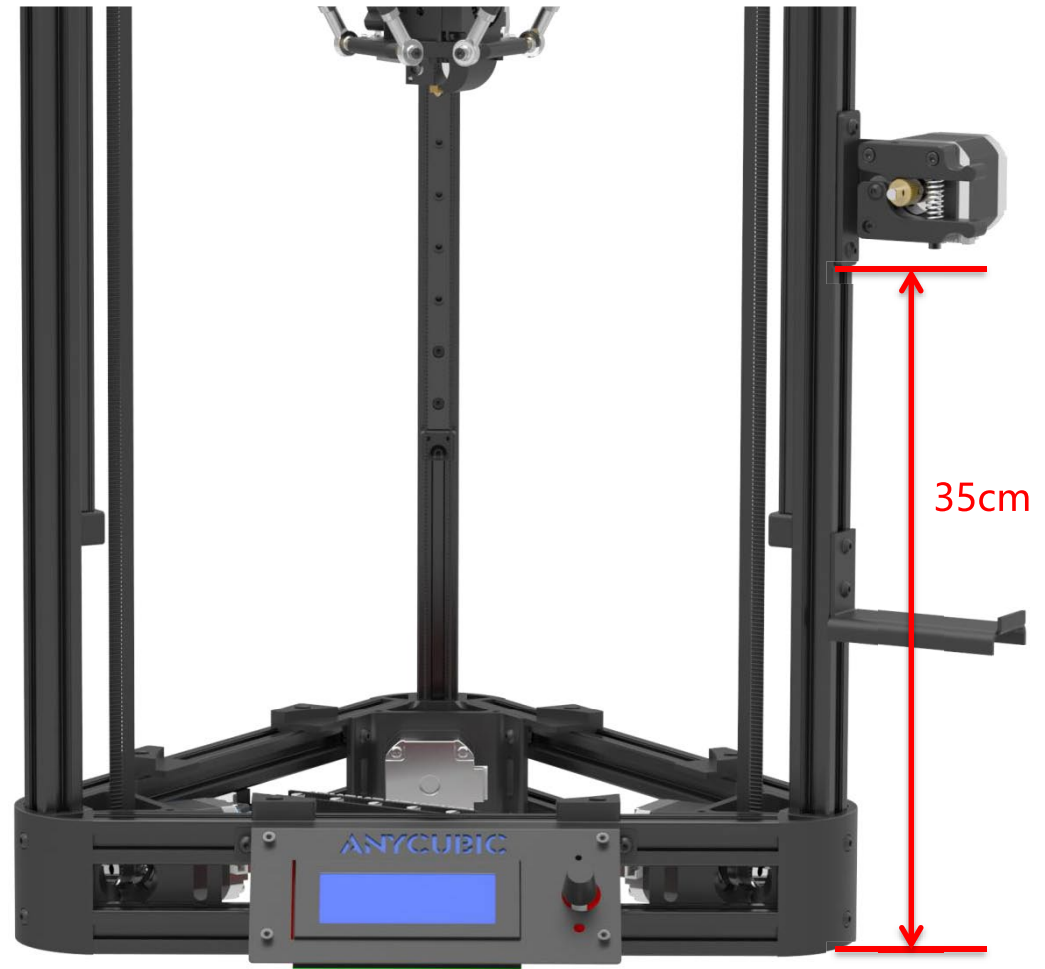


## S5 Filament holder, Extruder motor

① Pre-installed screws.  
(Do not tighten now).

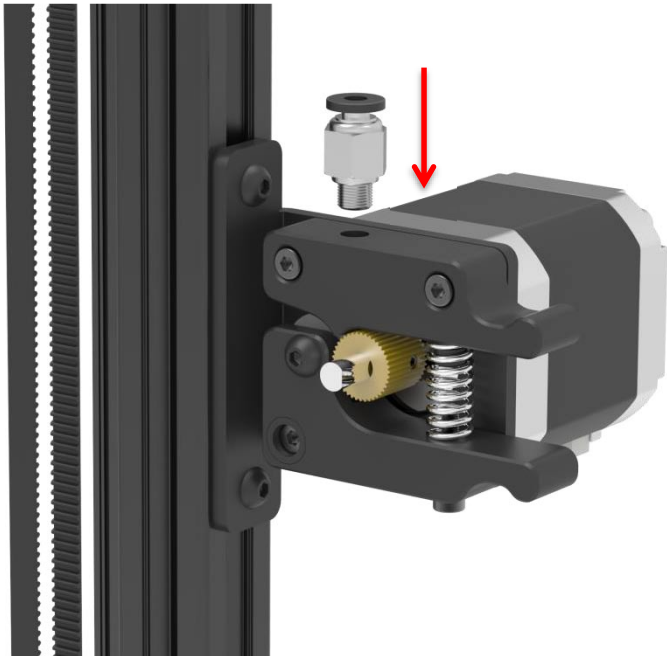


④ Install the extruder motor on the right side of the aluminum beam at 35cm height from the bottom frame.

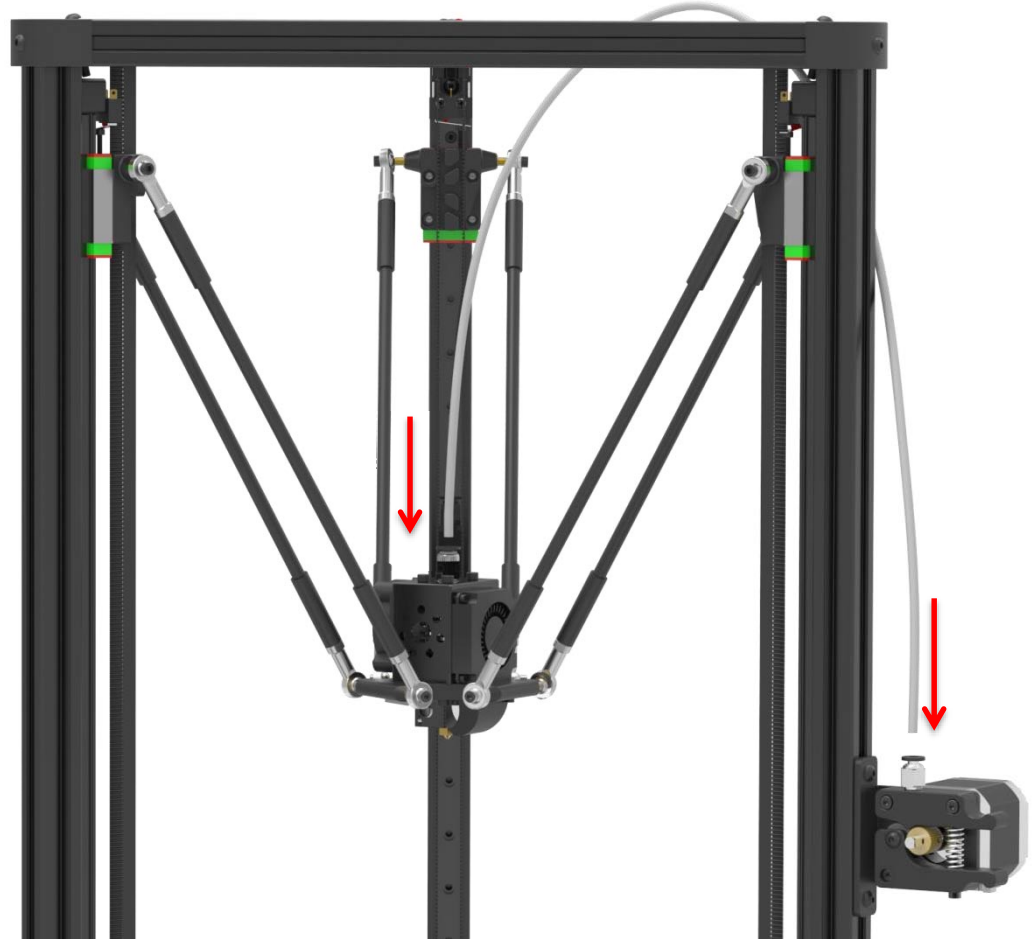


## S5 Filament holder, Extruder motor

⑤ Install the feed pipe connector into the extruder set.

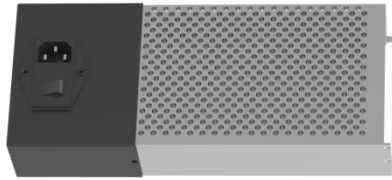


⑥ Insert the feed pipe into the feed pipe connector (shown by the red arrows).



# S6 Power supply

List



Power supply 1PCS

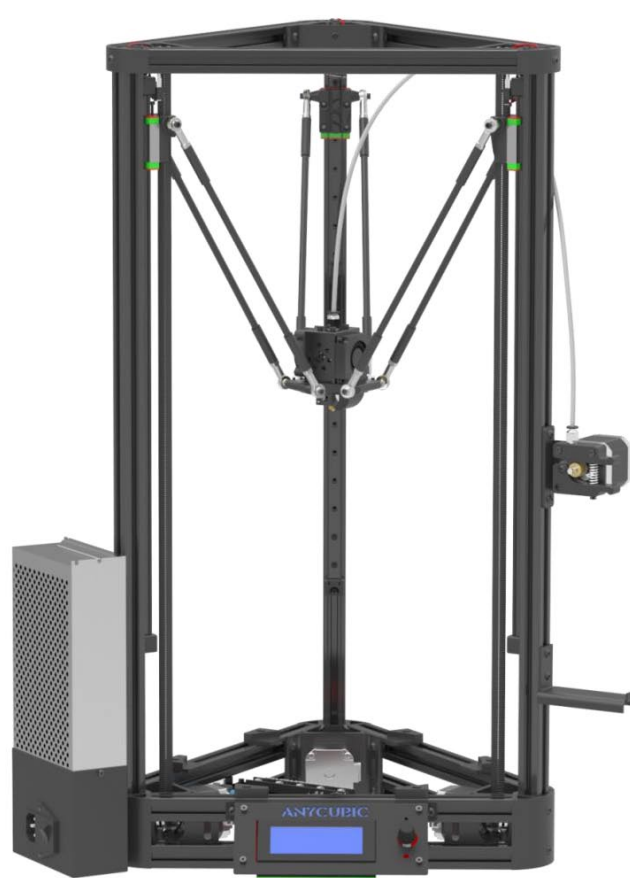


Power holder 1PCS



Parts pack 1PCS

Result



Linear Plus version



Pulley version

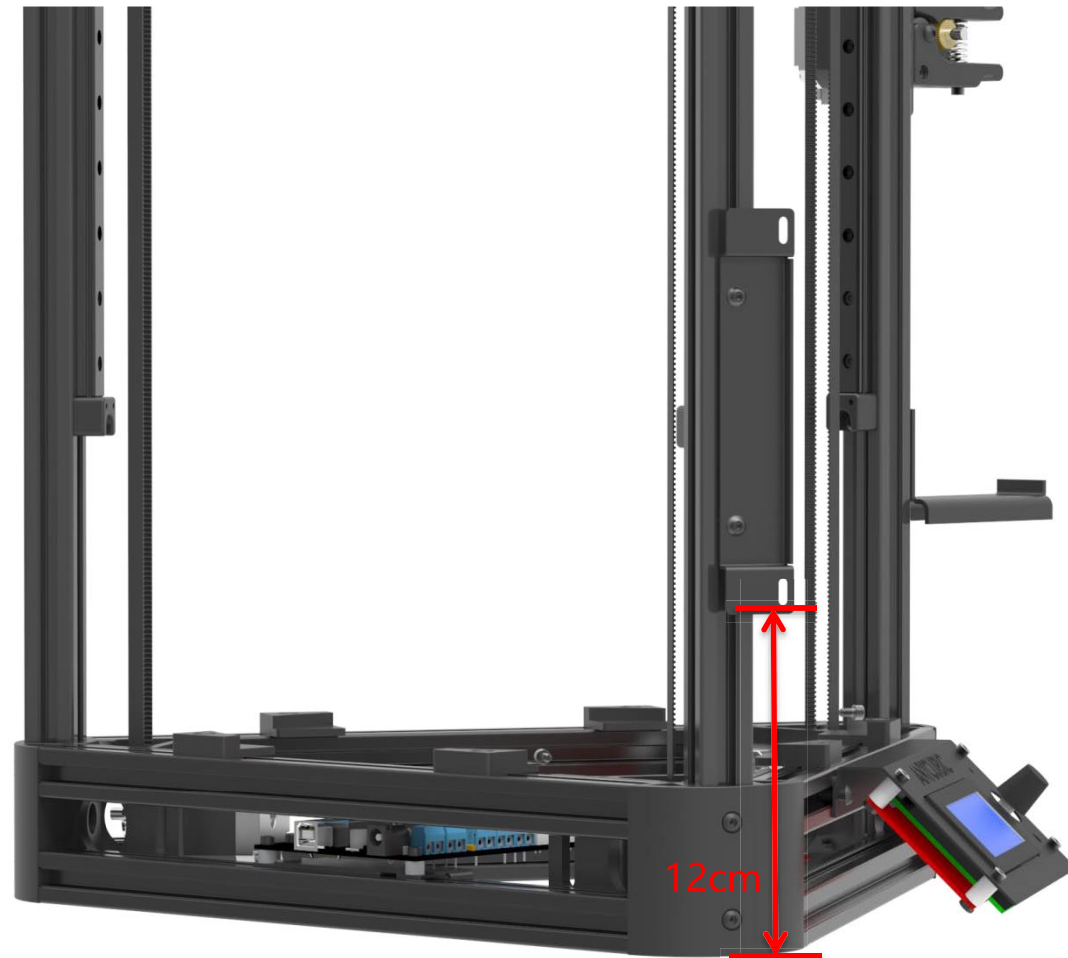


# S6 Power supply

① Pre-installed screws.



② Install the power holder on the left side of the aluminum beam at 12cm height from the bottom frame, ***please pay attention to the direction of the power holder.***





## S6 Power supply

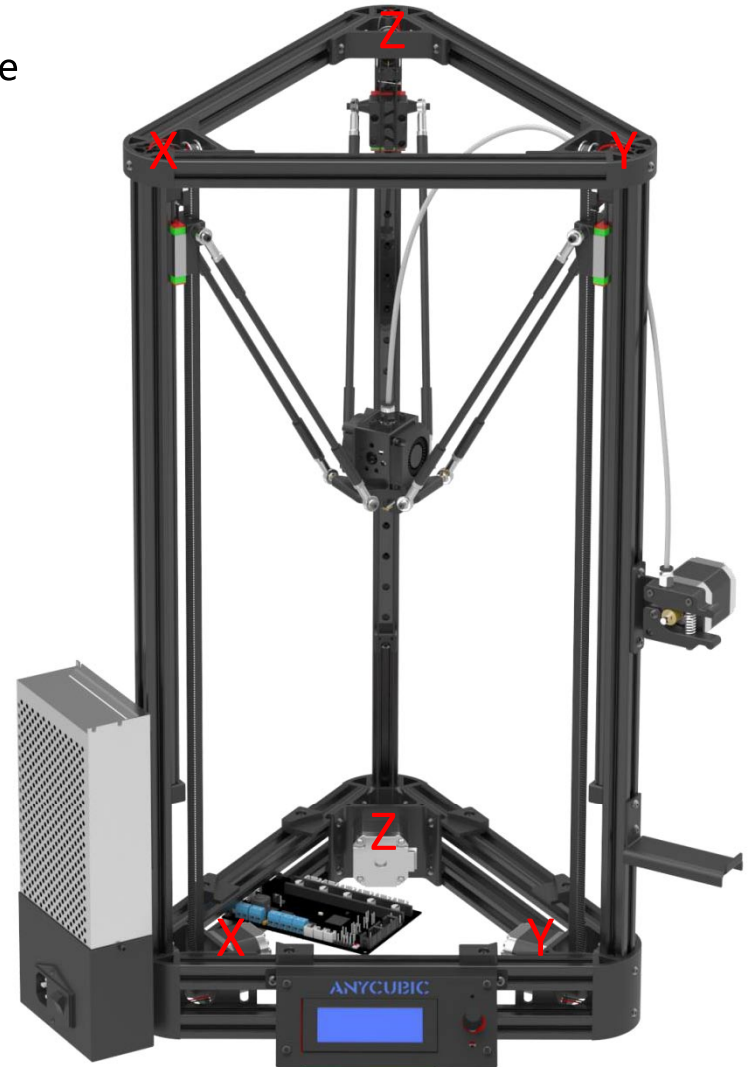
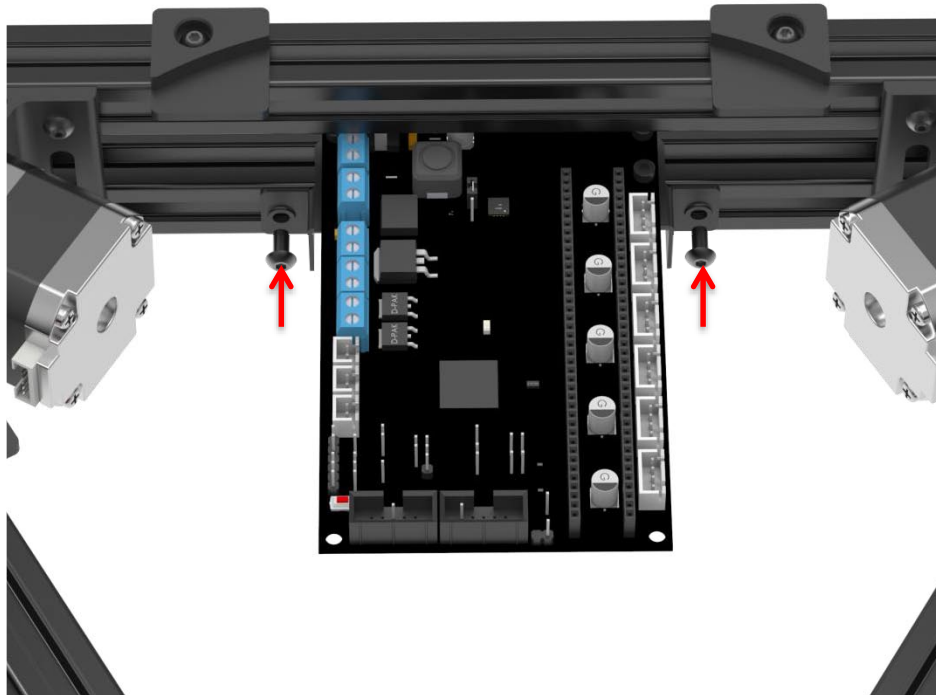
- ③ Secure the power supply to the holder with two M3 \* 5 screws.  
Let the bottom of the power supply set touching the desktop.



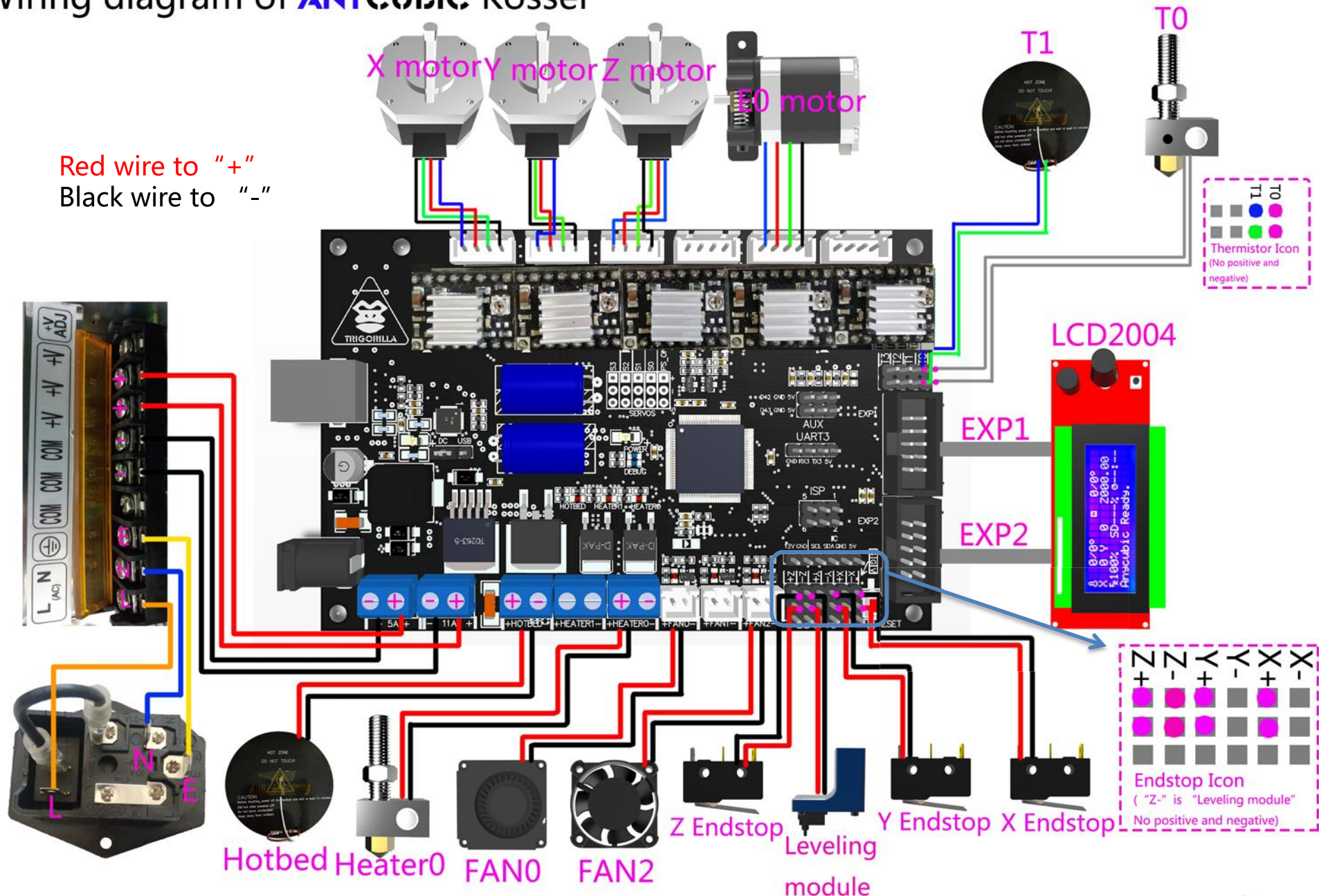
# S7 Wiring

Use the LCD screen as a reference, three motors are defined as X motors, Y motors, Z motors counterclockwise and the corresponding end stops are defined as X end stop, Y end stop and Z end stop respectively.

① For easy wiring, first loosen the two screws of mainboard shown by red arrows.



# Wiring diagram of ANYCUBIC Kossel

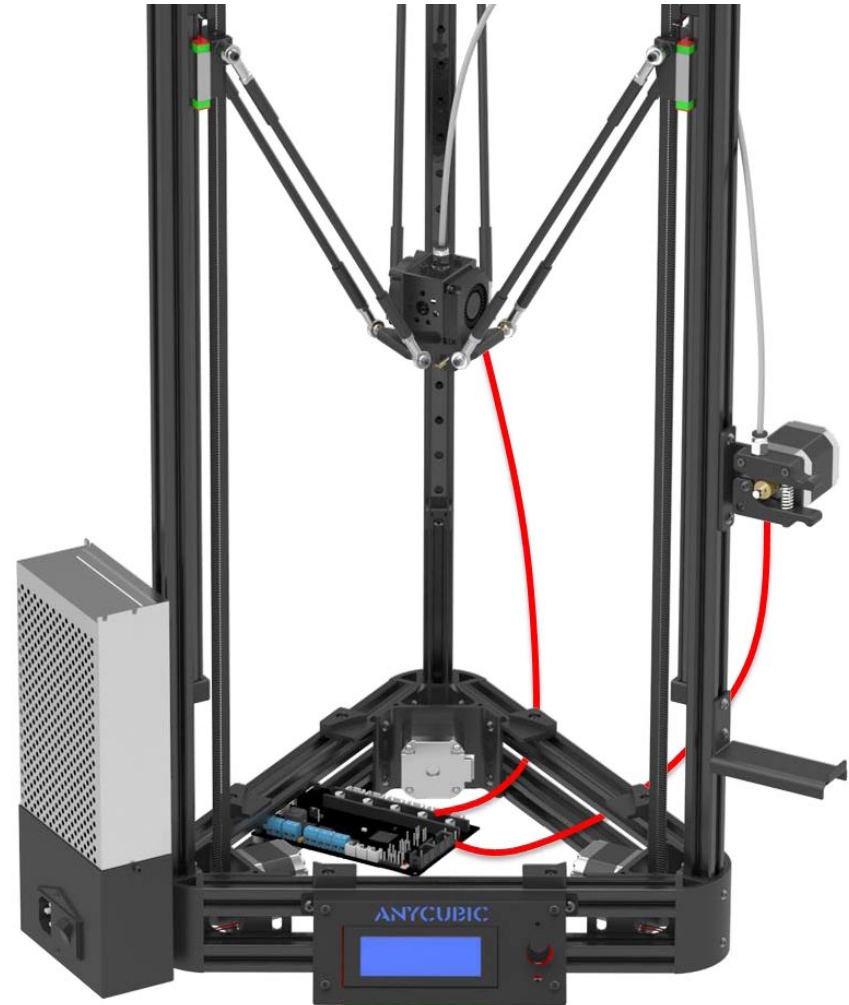
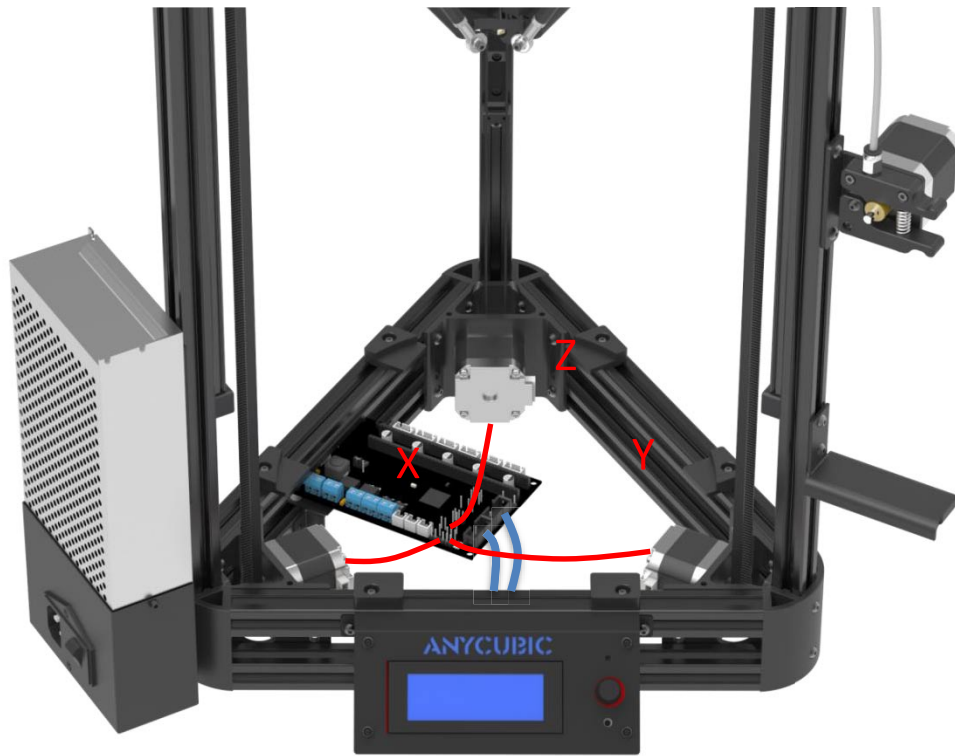


There are more wiring directions in following pages.

# S7 Wiring

② Red lines here represent the limit switch wires.  
Blue lines represent the LCD screen wires.

③ Please refer the wiring direction of the print head and extruder motor.



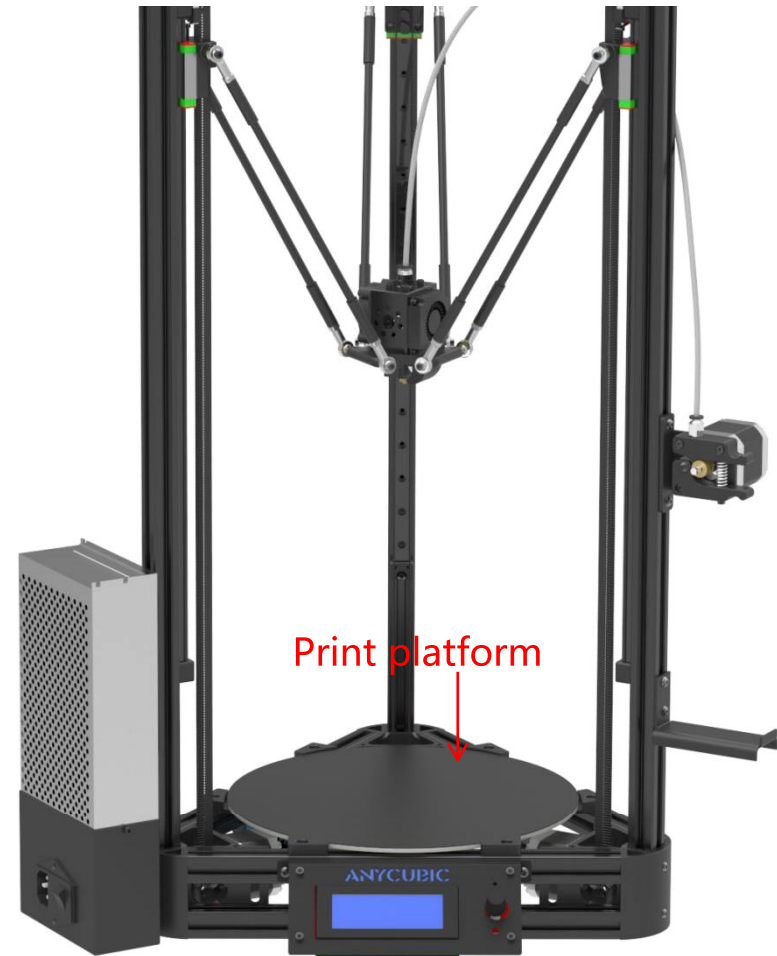


# S7 Wiring

④ The wiring direction of the power supply.



⑤ Connect the hot bed wire according to the wiring diagram, and then reinstall the mainboard. Finally fasten the screws on the platform blocks and secure the hot bed.



**Till now, the mechanical assembly is finished, next there will be instruction for set-up.**

## Setup/Print

- Level
- Driver installation
- Introduction to slicing software

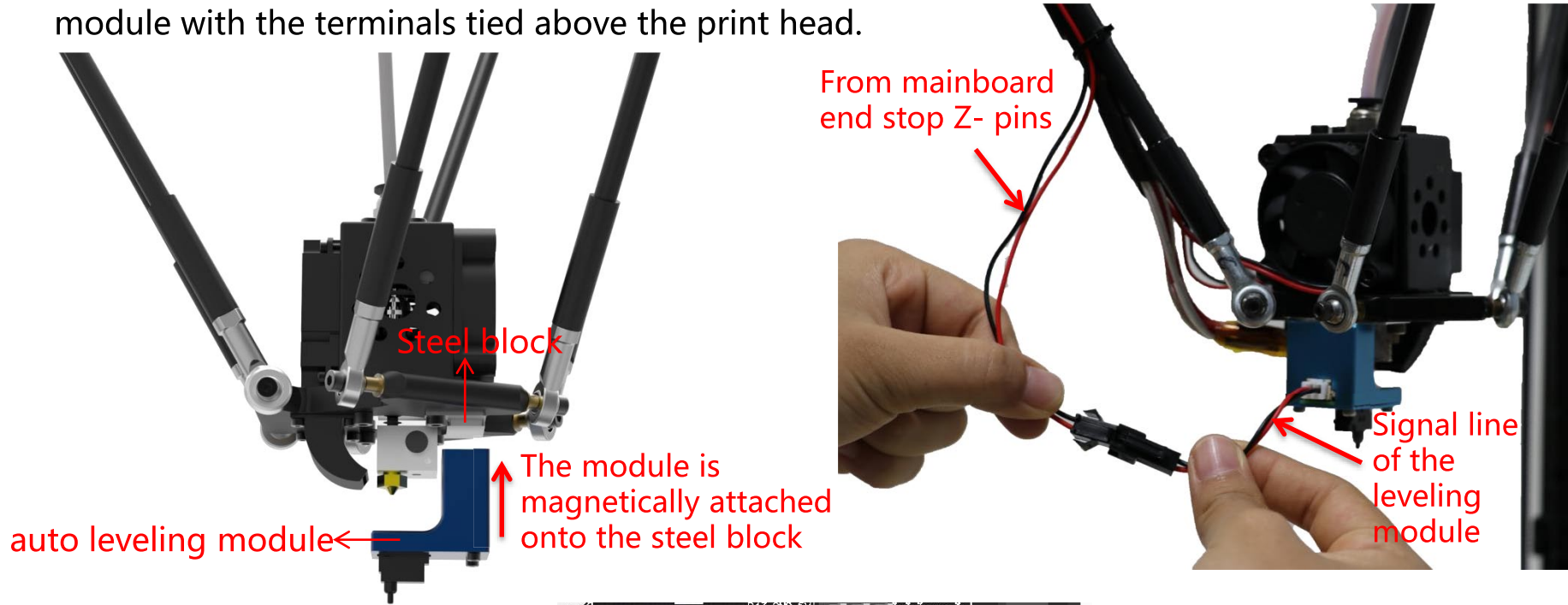
# Leveling

- ◆ There are two methods to level the platform of Kossel 3D printer ① **Automatic leveling** ② **Manual leveling.**
- ◆ It is recommended that customers use automatic leveling for **ANYCUBIC** Kossel. It contains four steps: ① **Install the leveling module** ② **Height measurement** ③ **Automatic leveling** ④ **Install filament and Test Print.**
- ◆ After level for the first time, it is NOT necessary to auto level the platform before every prints. Only level the platform when the relative position among platform, nozzle, and limit switches has been changed.
- ◆ Customers can level the platform by operating through the LCD screen (offline) and there will be more interpretation in the following section. Alternatively, customers may also proceed with automatic leveling through *Cura (ANYCUBIC Edition)*. Please visit our website [www.anycubic3d.com](http://www.anycubic3d.com) to download this software (*Beta version*).
- ◆ If you choose manual leveling, please also visit our website for more information.

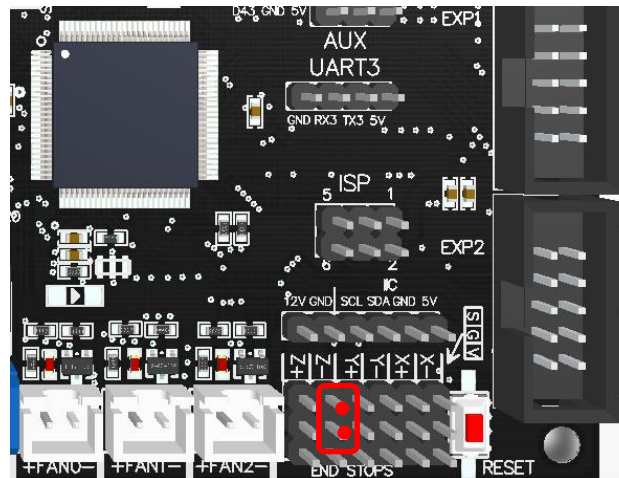
# Leveling

## 1、 Install the leveling module

Install the auto leveling module on the print head, and connect the terminals on the leveling module with the terminals tied above the print head.



TriGorilla  
mainboard

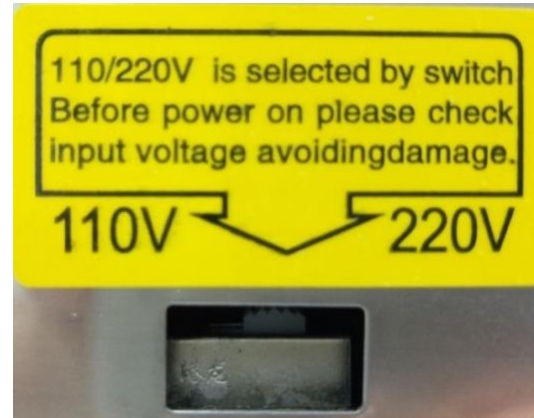




# Leveling

## 2、 Height measurement

Make sure all the wires are connected correctly; Select the correct voltage mode according to your local voltage ratings (**110V/220V**). The switch is inside the power supply and 220V is default, as shown in Figure(1). Hex keys can be used to move the switch inside. After that, plug in the power cord and switch on the printer, as shown in Figure(2).



(1)

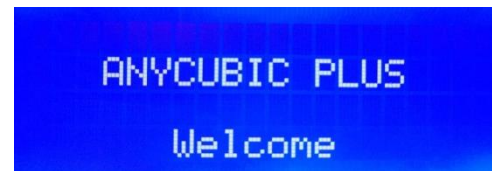
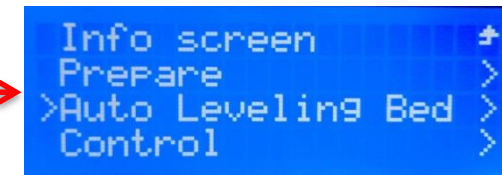


(2)

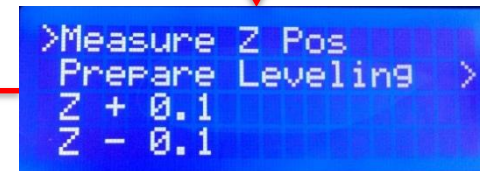
After install the auto leveling module, press the knob on the LCD screen to enter the main menu, navigate and press the knob : "Auto Leveling Bed" → " Measure Z Pos" , then the printer will start the height measuring (*what happens: the auto level probe will detect 69 points on the platform and then the print head will be auto homing and then reboot, please wait until this finished*).



Main menu



Reboot



# Leveling

## 3、 Automatic leveling

### (1) Automatic leveling

Follow the last step, after the printer reboots, navigate the knob and go to the "Auto Leveling Bed" → "Prepare Leveling" → "Begin Leveling" , the printer will start bed leveling automatically (*What happens: the probe will automatically detect 69 points on the platform and then the print head will be automatically homing, and finally will stay just above the platform center*).

```
Info screen      ⚡
Prepare         >
>Auto Leveling Bed >
Control        >
```



```
Main           ⚡
Measure Z Pos  >
>Prepare Leveling >
Z + 0.1
```

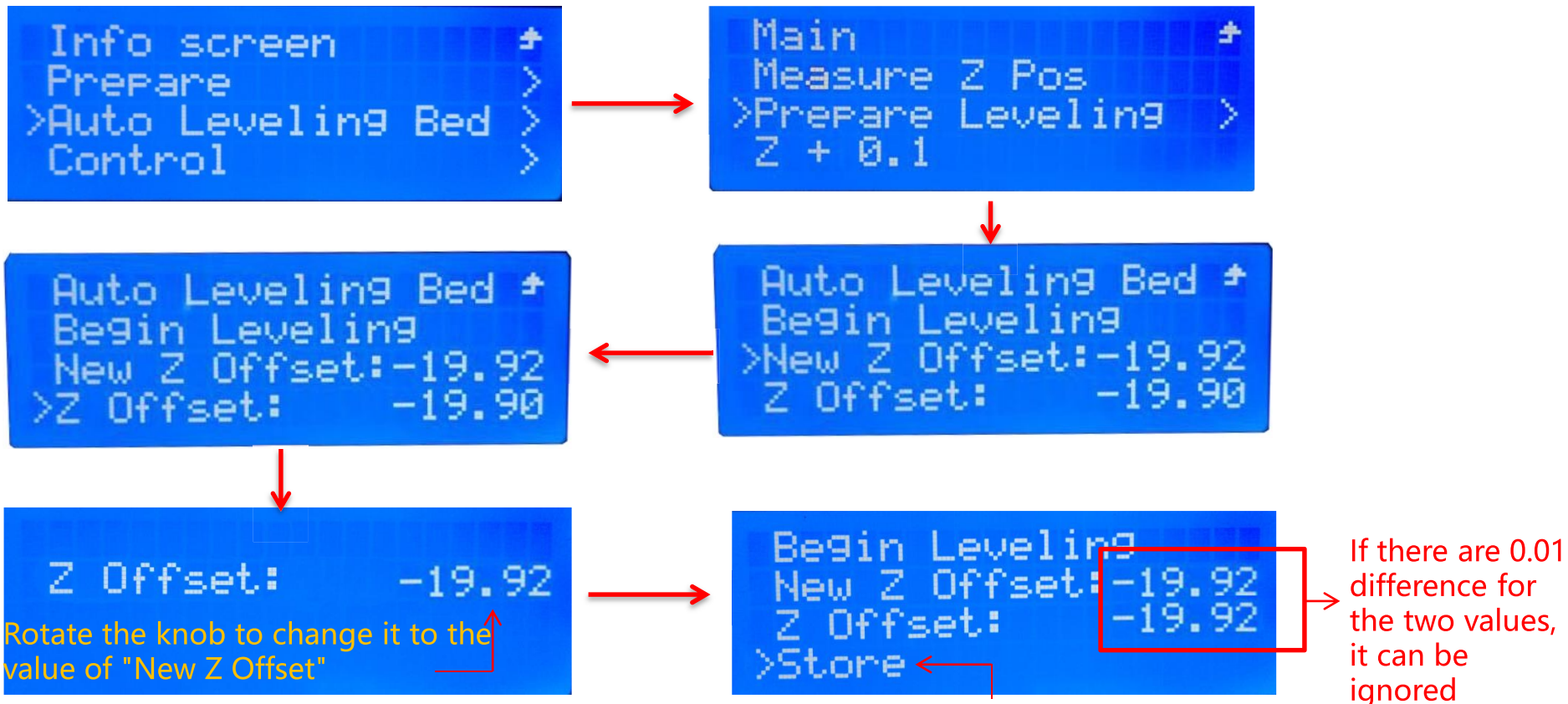


```
Auto Leveling Bed ⚡
>Begin Leveling
New Z Offset:000.00
Z Offset:      -19.90
```

# Leveling

## (2) Modify Z Offset

After automatic leveling, navigate the knob and go to: "Auto Leveling Bed" → "Prepare Leveling". At this time, on "Prepare Leveling" interface, there is a value for the "New Z Offset". Now, click the "Z offset", and **change the "Z offset" value to the "New Z Offset" value**. After changing, press the knob to confirm and go back to last menu and click "Store" to confirm the change.



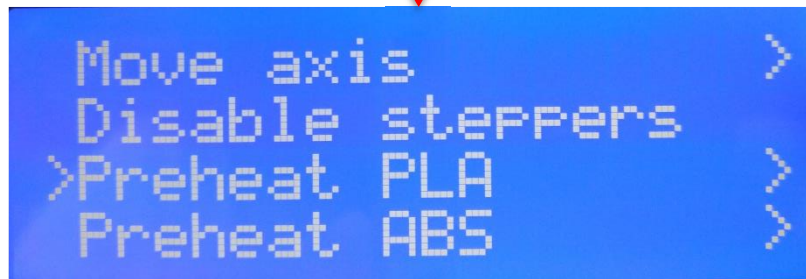
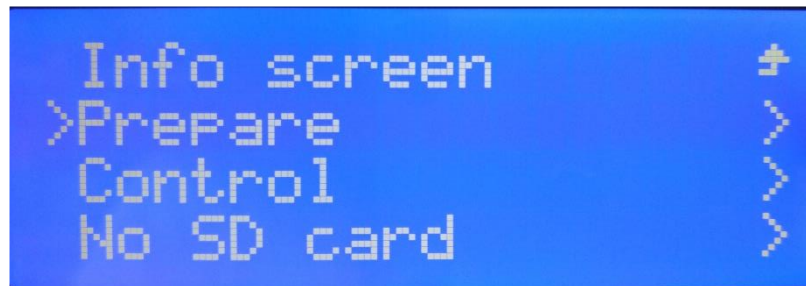
After "Z offset" and "New Z Offset" are set to the same, press Store.

# Leveling

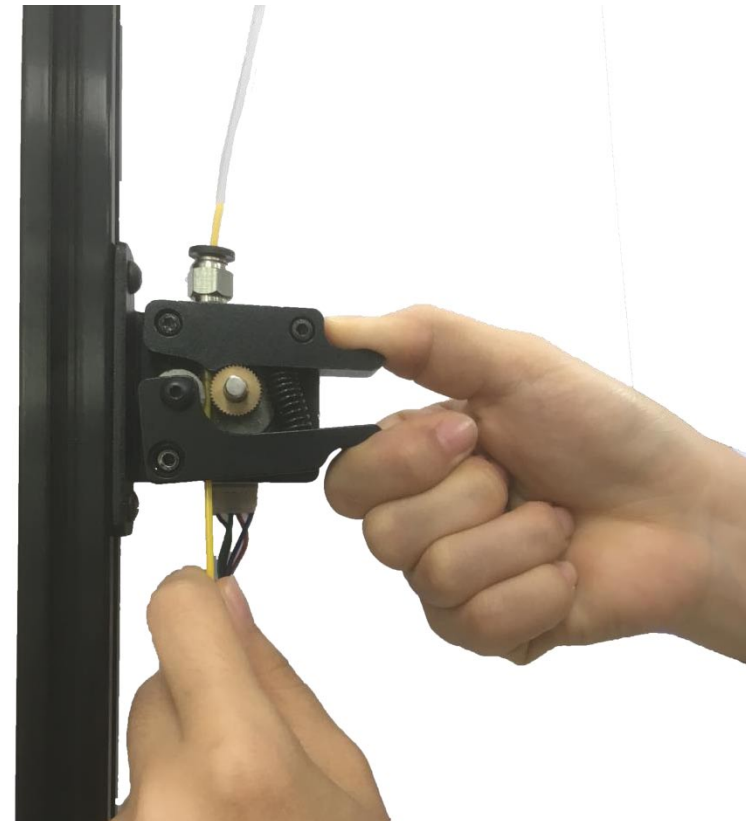
## 4、 Install filament, Print test

### (1) Install filament

**Remove the print module** and preheat the nozzle, choose "Prepare" → "Preheat PLA" on screen menu, as shown in Figure(3). When it reaches the target temperature, press down the handle on the extruder by hand and push the filament until it melt through the nozzle tip (get rid of that by tweezers), as shown in Figure(4).



(3)



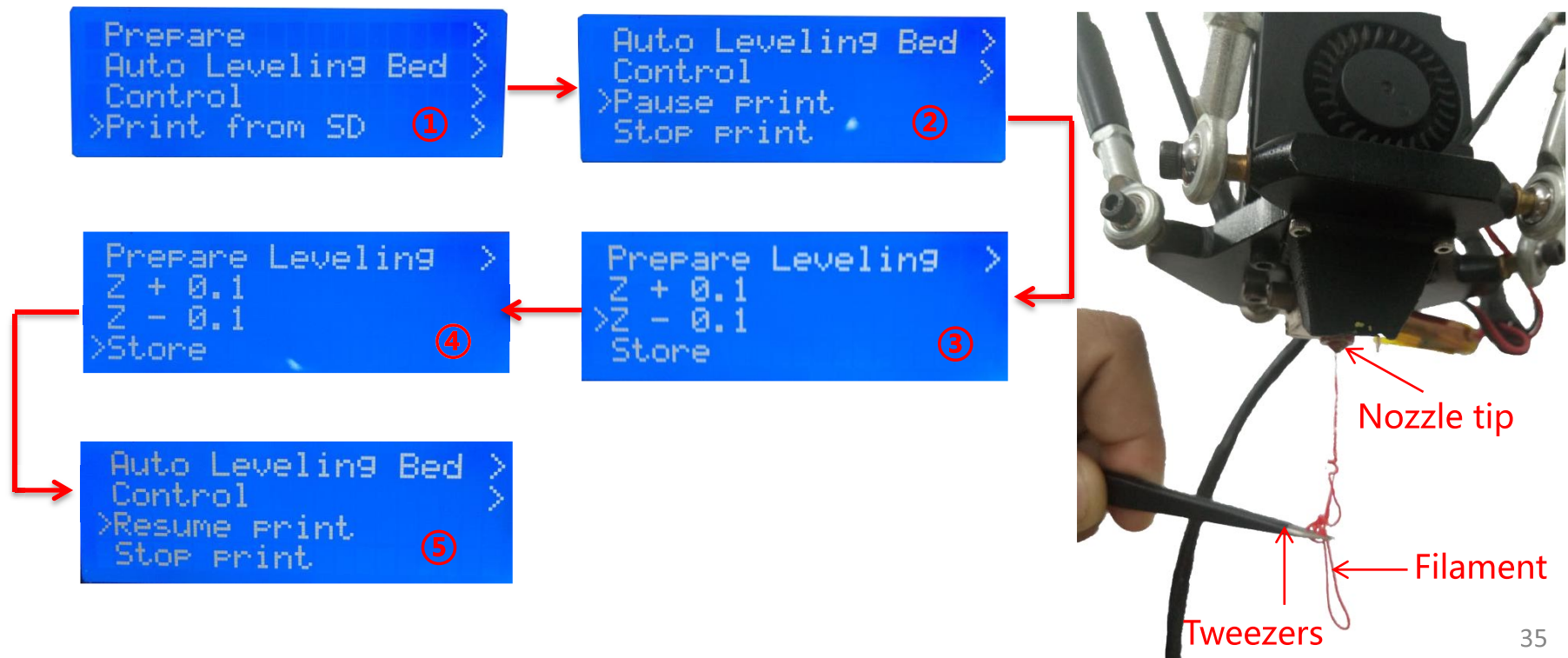
(4)



# Leveling

(2) Test Print (**Remove the auto level module before test print!! Otherwise it will be damaged!!**)

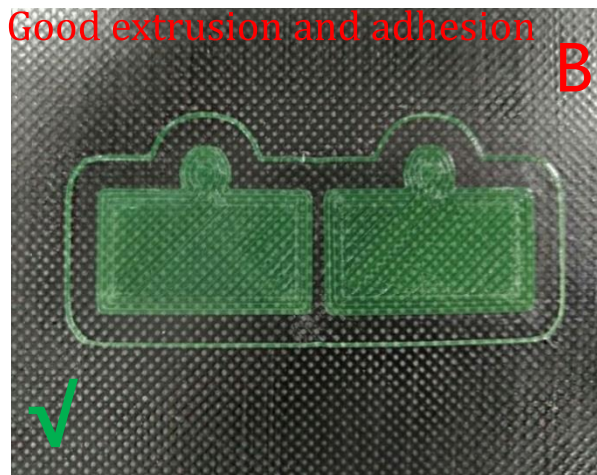
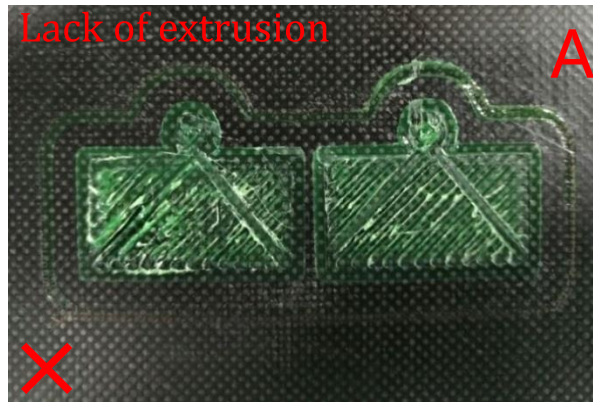
Through the LCD knob : "Print from SD" , select the "Testing" file on the SD card for printing. If the extruded material does not stick well on the platform (nozzle too high) or insufficient (nozzle too close), Press "Pause print" and **please wait for the printer to pause, because the printer will finish the last command before pause. When pause, the print head will raise by 1cm.** After pause, press "Z-0.1" in the "Auto Leveling Bed" menu (when nozzle is too close to the platform, then press "Z + 0.1" ). After that, **press "Store" to save it.** Use tweezers to clean the filament on the nozzle, press "Resume print" to verify. You may have to fine tune this few time until satisfying results.



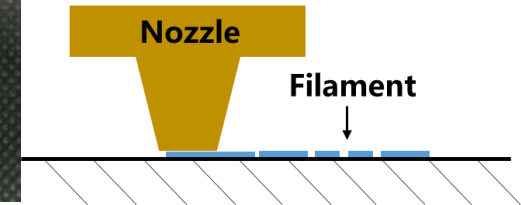
# Leveling

Observe the print results, if extruded material still could not stick well to the platform (nozzle too high ) or insufficiently squeezed (nozzle too close), pause printing again. Adjust the Z offset value and store it and then resume, it may need adjustment for few times until satisfying results such as Figure B.

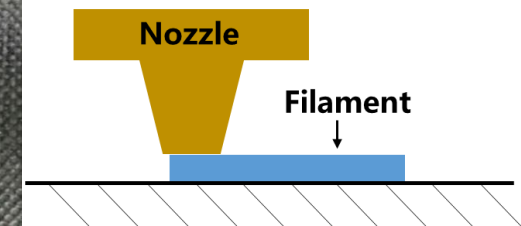
Till now, the leveling process is finished. Customers may print offline via SD card if there are Gcode files in the SD card. For controlling the printer via PC, next we will explain how to install the driver and slicing and PC control software-Cura.



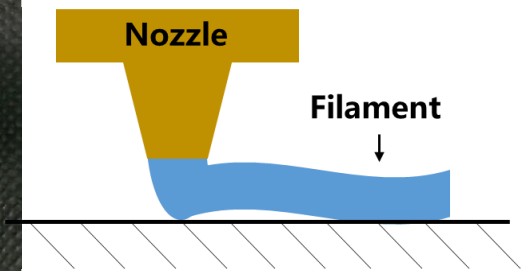
Nozzle too close



Proper nozzle height



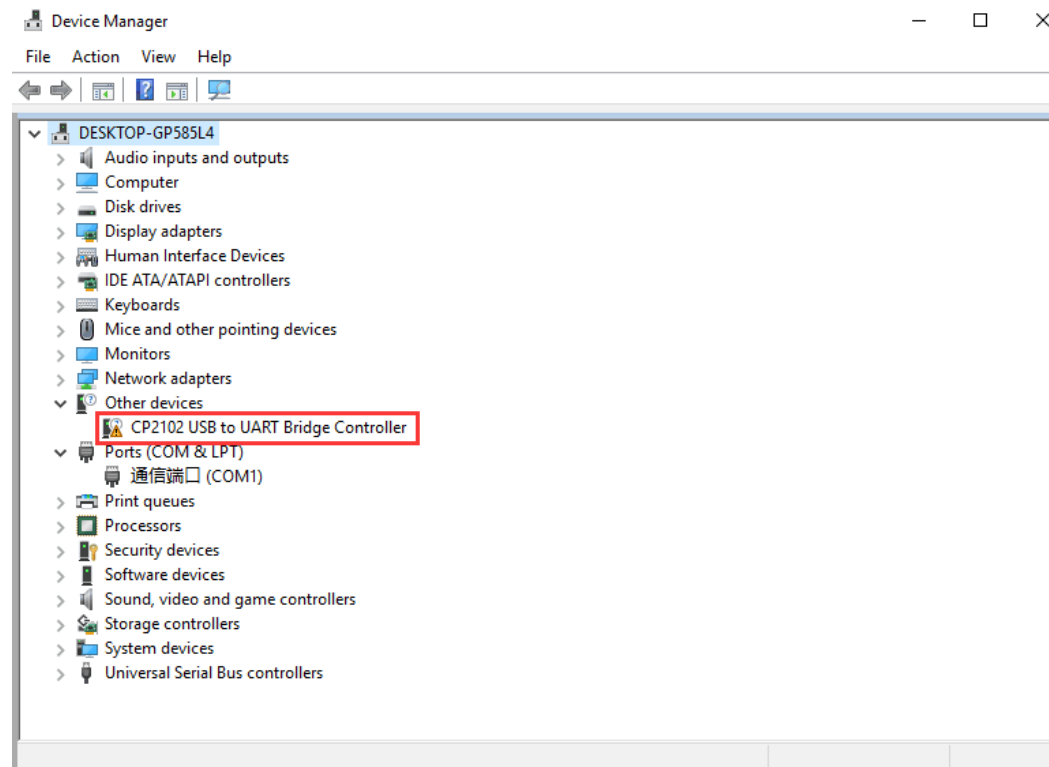
Nozzle too high



Examples

# Driver installation

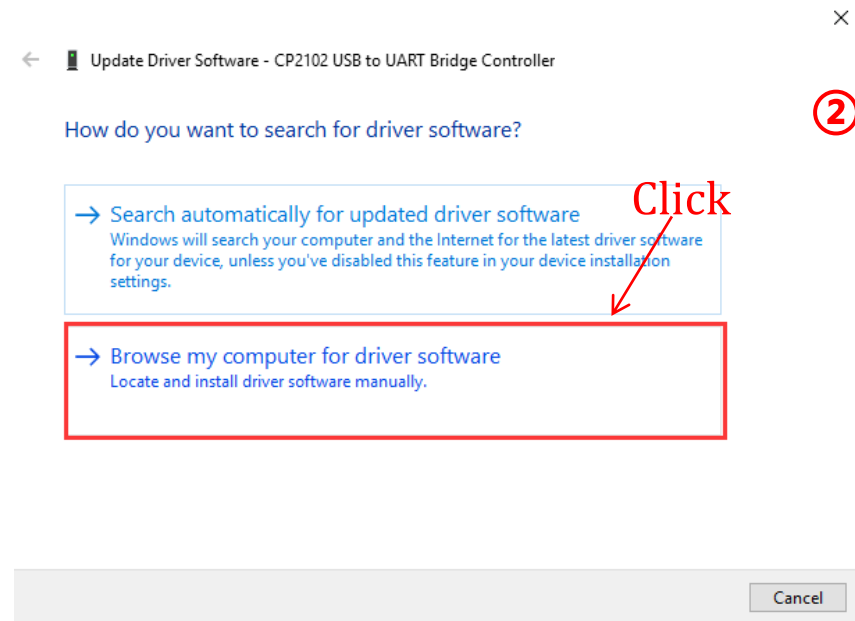
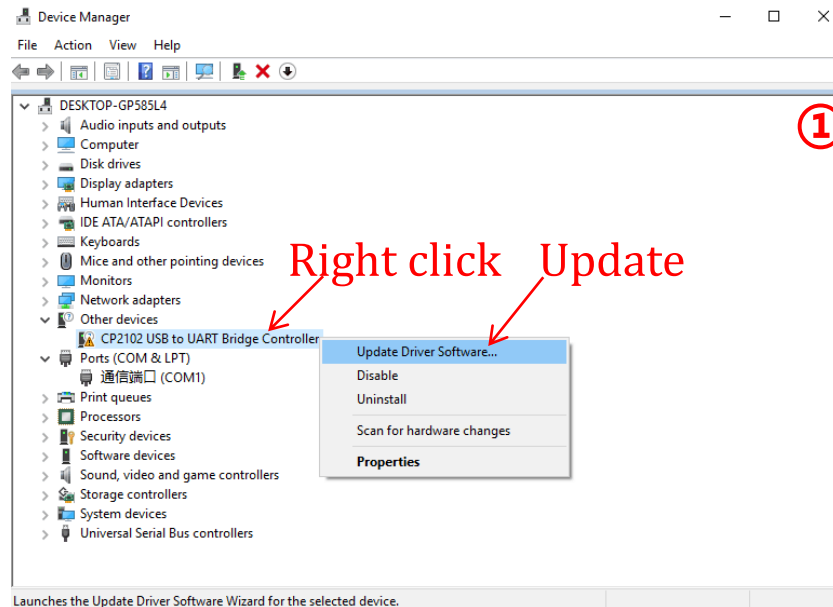
First, switch on the machine, use the USB cable to connect the printer (via USB port on mainboard) and your PC. **ANYCUBIC** Kossel 3D printer uses CP2102 chip for communication so we have to install the CP2102 driver (sometimes it may be installed automatically when PC connects to printer for the first time). As shown in figure below, right click "This PC" → "Properties" → "Device manager", if there is an exclamation mark as shown below, then we need to install the driver manually.



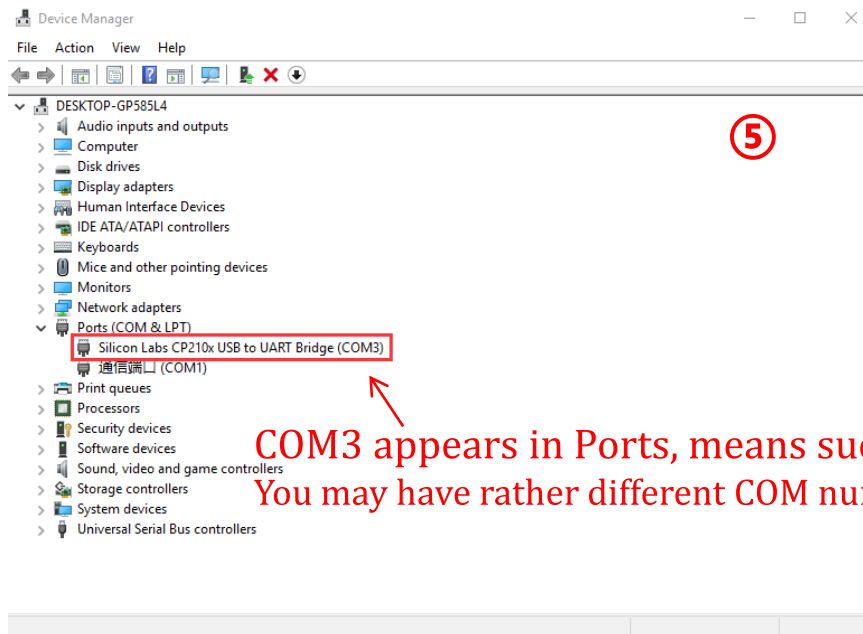
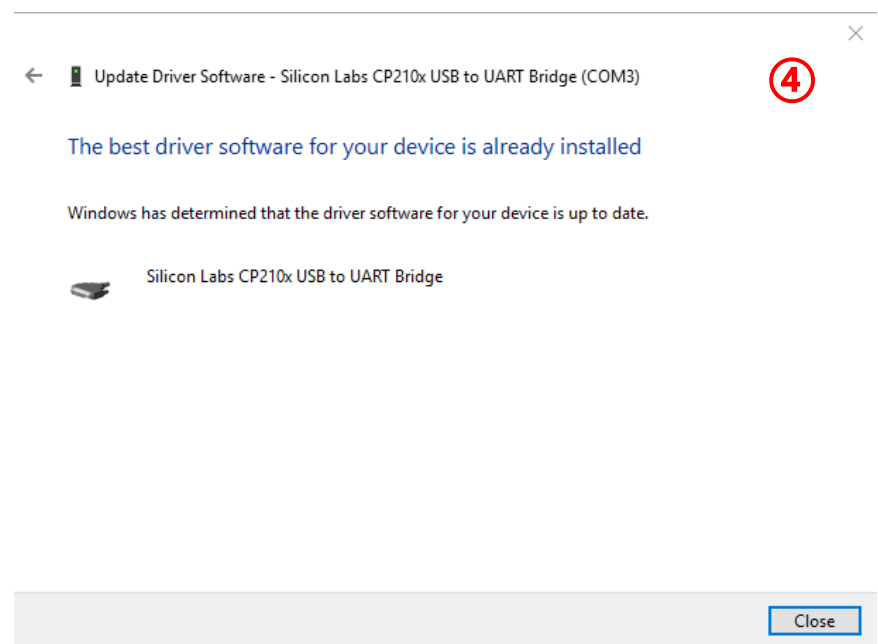
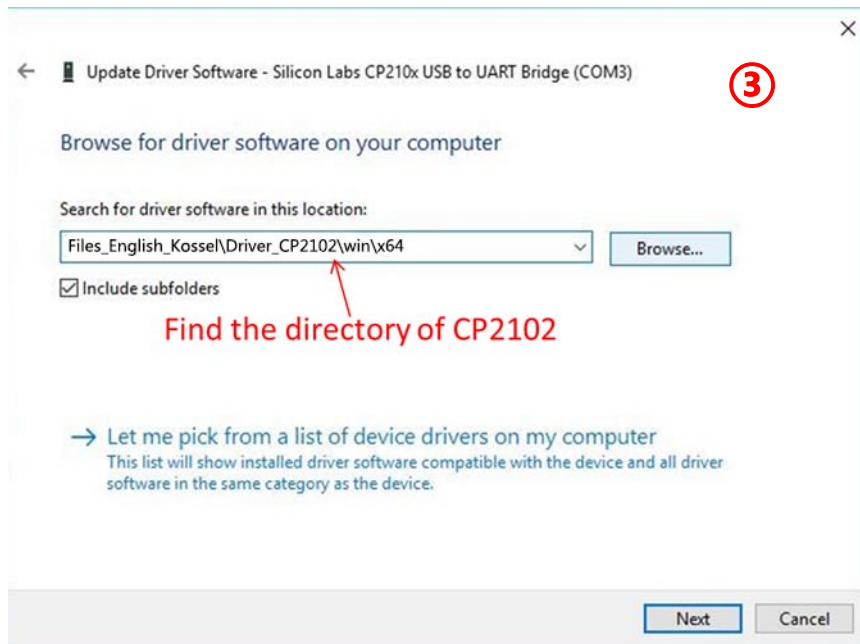


# Driver installation

CP2102 driver files are located in the SD card. "Files\_English\_Kossel" → "Driver\_CP2102" → "Windows" ( "CP210xVCPInstaller\_x64" is for 64 bit PC system and "CP210xVCPInstaller\_x86" is for 32 bit PC system). Here we take Windows 7 and 64 bit PC system for example:



# Driver installation

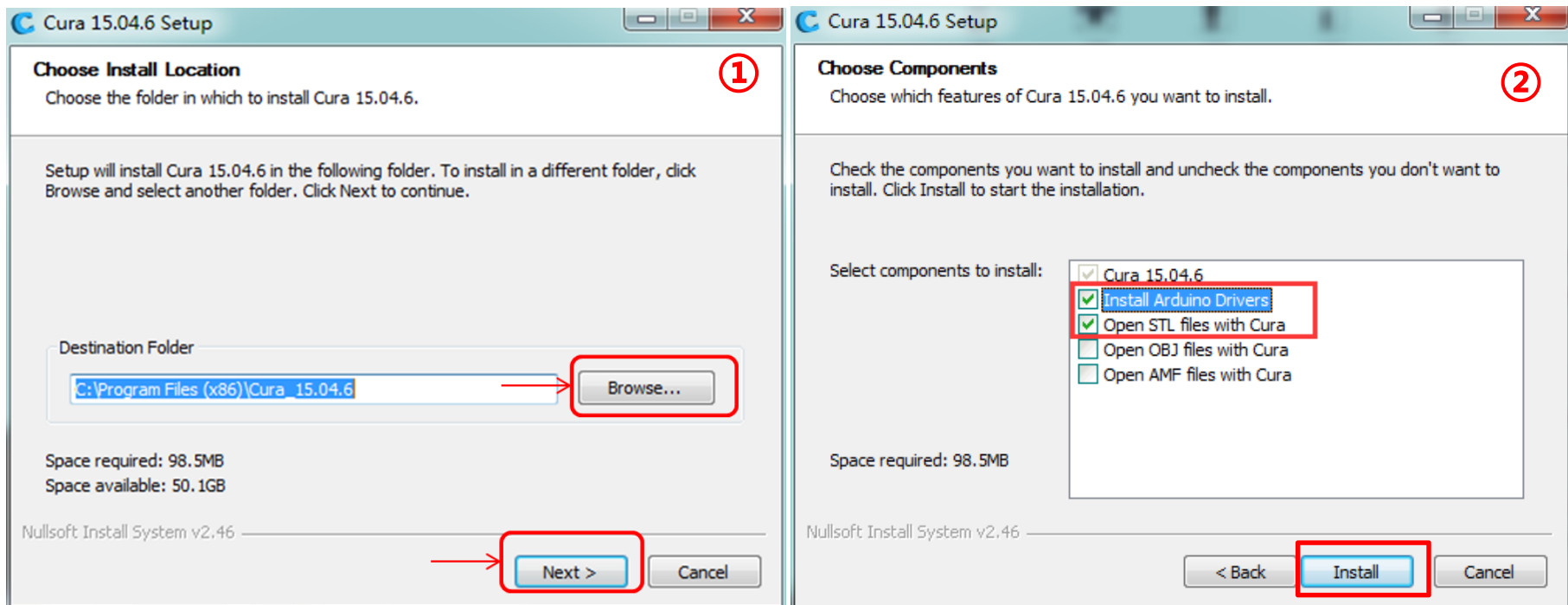


# Introduction to slicing software

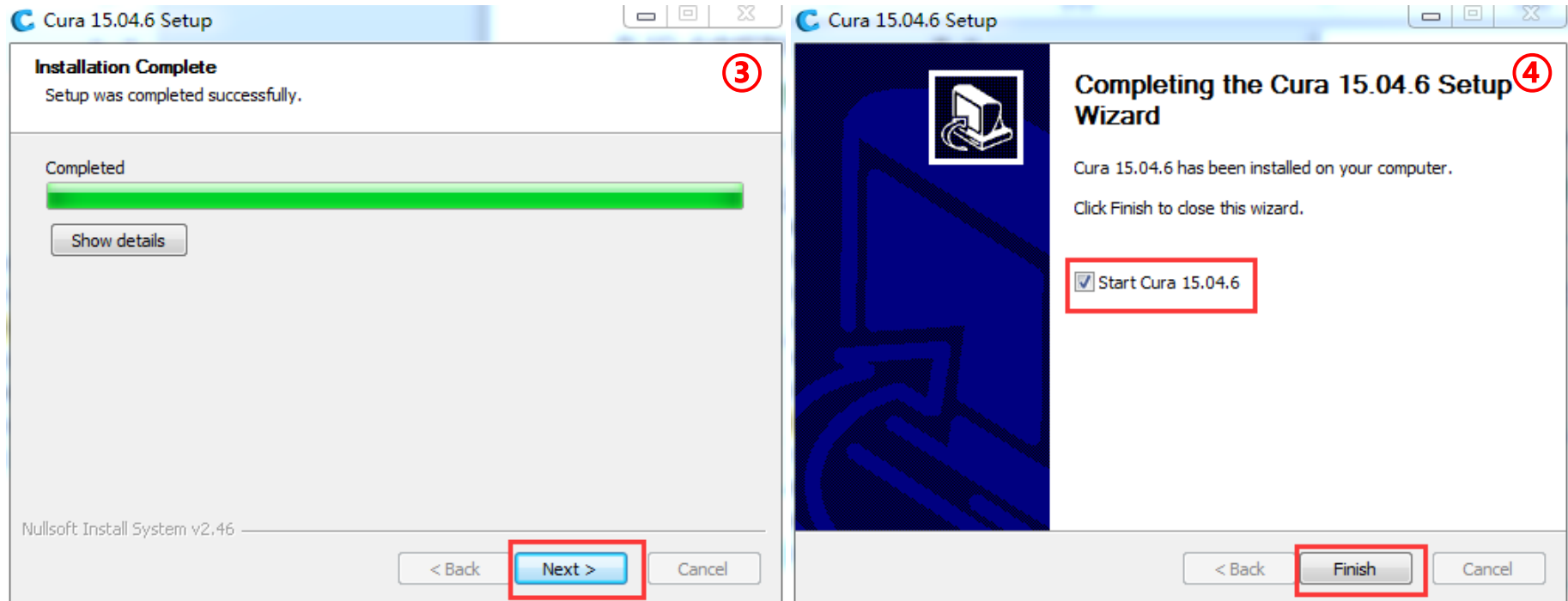
## 1、 Cura installation

**ANYCUBIC** Kossel 3D printer reads Gcode file and prints. It is necessary to convert 3D files (such as stl file) into Gcode files for machine to recognize. Software that convert 3D files into Gcode files is called slicing software. Slicing software, Cura\_15.04.6 is used for example here.

Cura15.04.6 is located in SD card: " Files\_English\_Kossel" → " Cura" → " Windows" . Double click "Cura\_15.04.6" , and follow the steps as shown below.

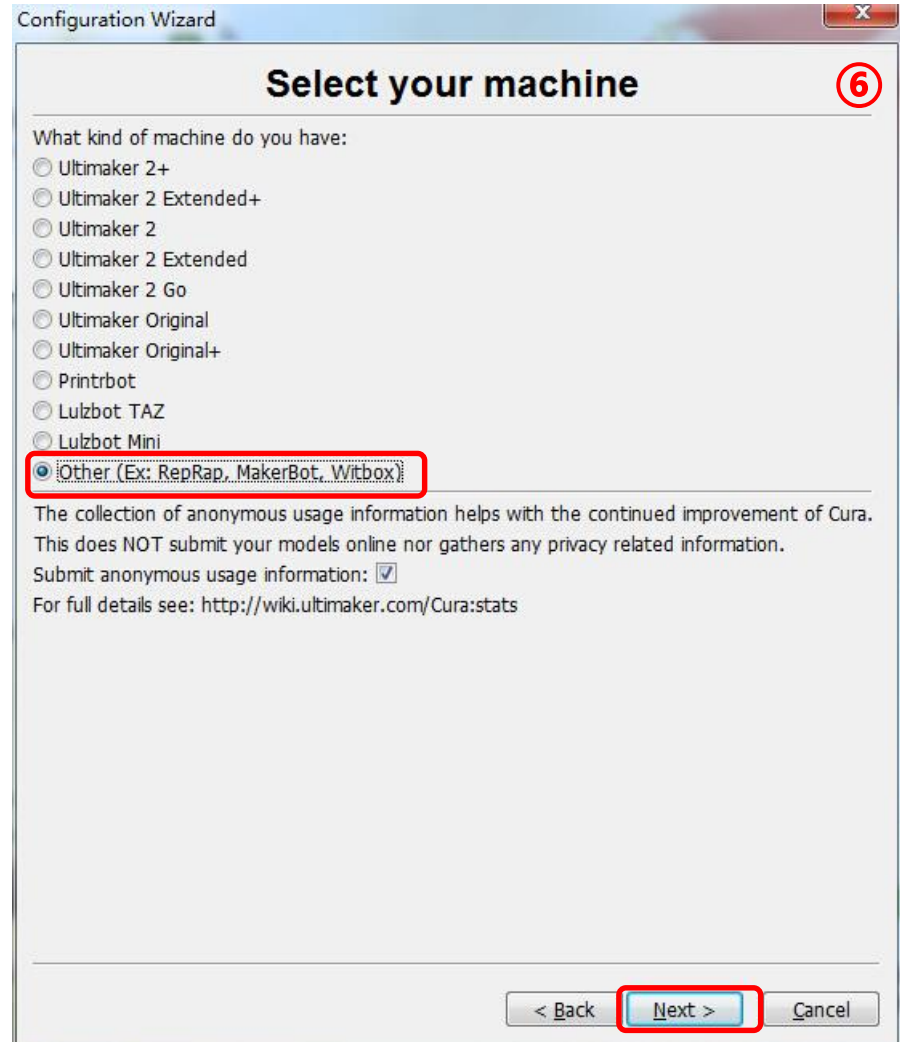
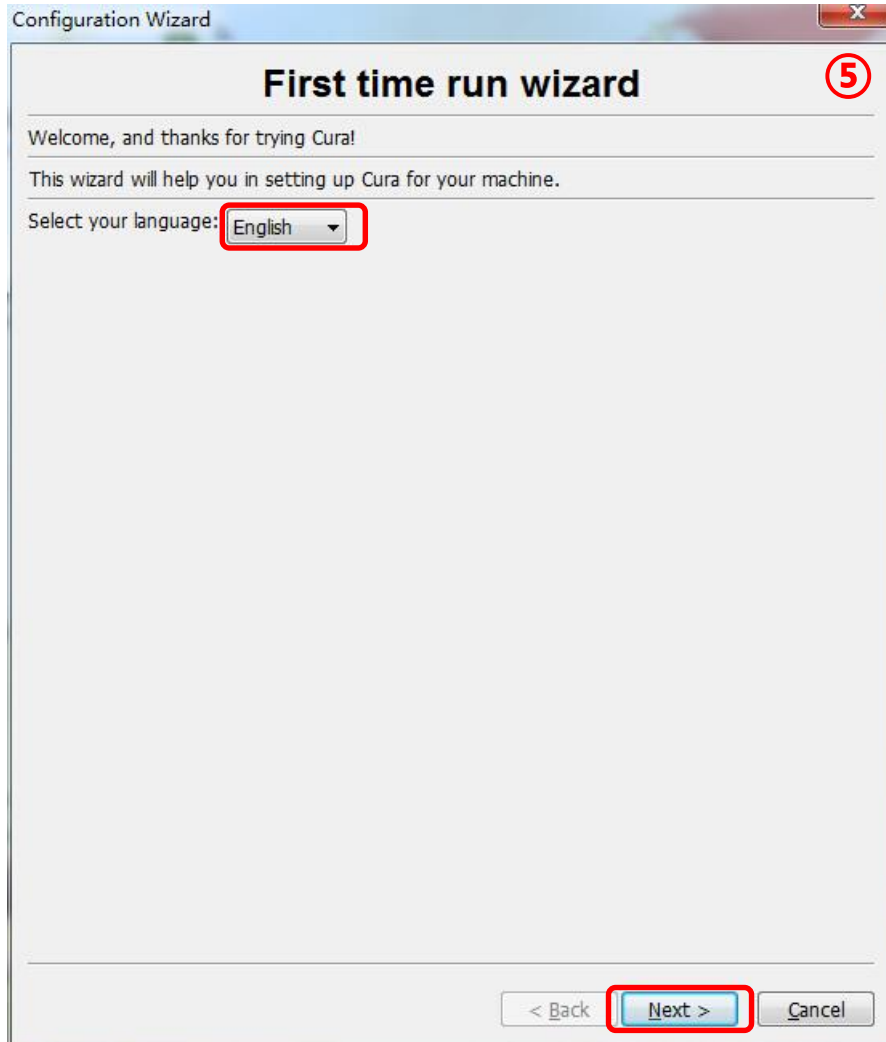


# Introduction to slicing software

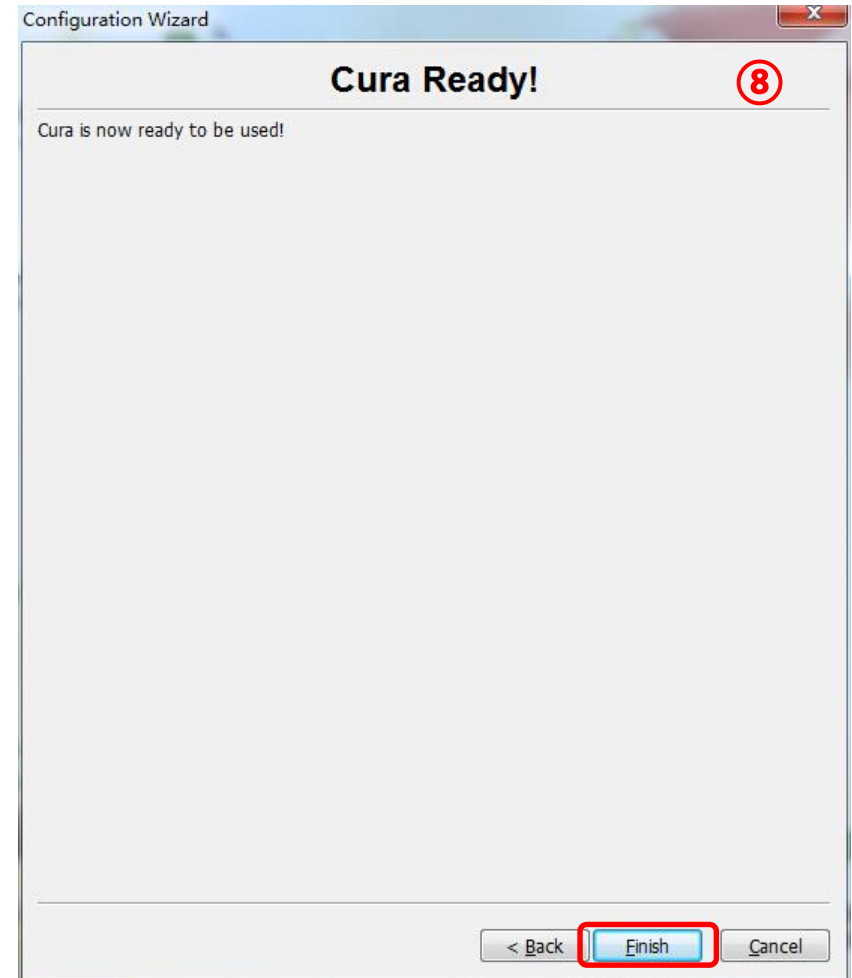
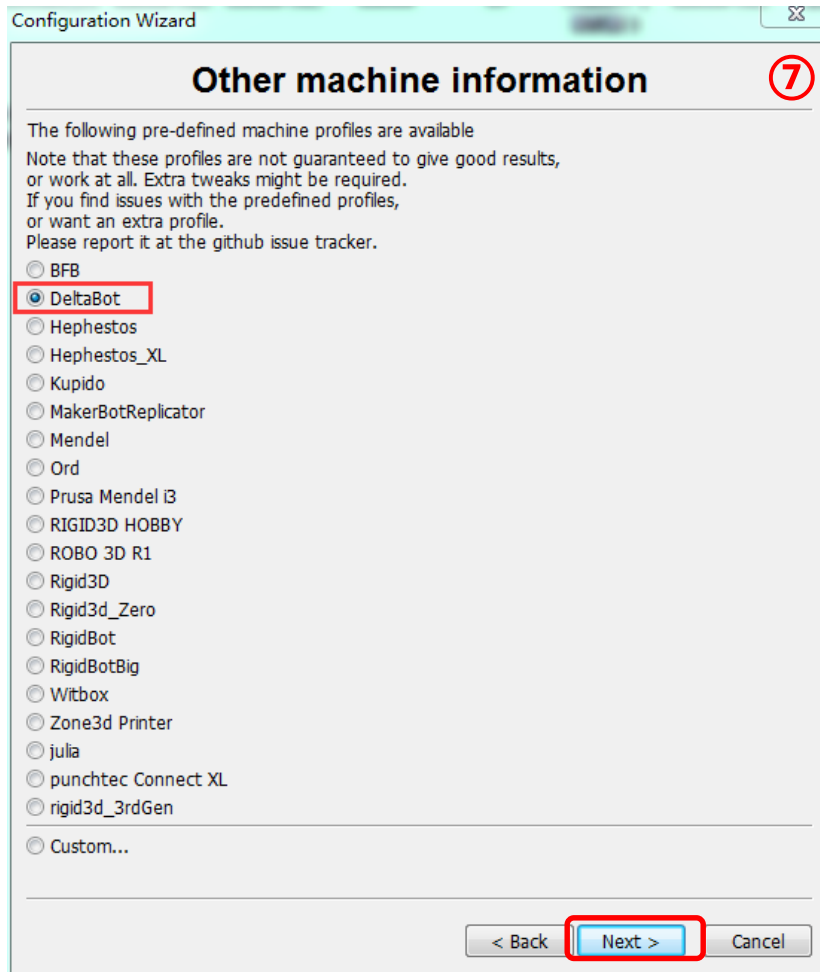


Next, before start Cura for the first time, there will be more settings about the language and machine types, users please refer to the following examples:

# Introduction to slicing software



# Introduction to slicing software

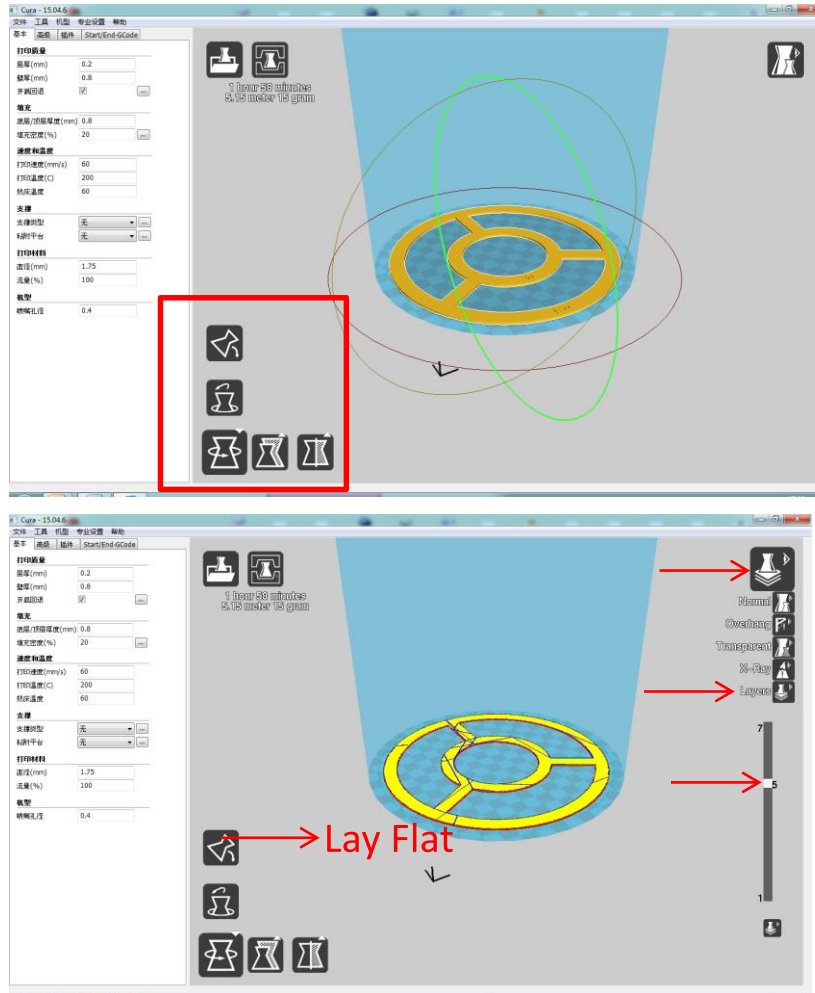


Upon finish, open Cura for the first time, there might be a default robot model appears, customers may click "File" → "Clear platform" to delete it.

# Introduction to slicing software

## 2、 Manipulate 3D model in Cura

In the Cura software interface, click on the “file” → “Load model file” to import your own three-dimensional format model (such as .stl file). Users can “Rotate” “Scale” “Mirror” the model. As shown below:

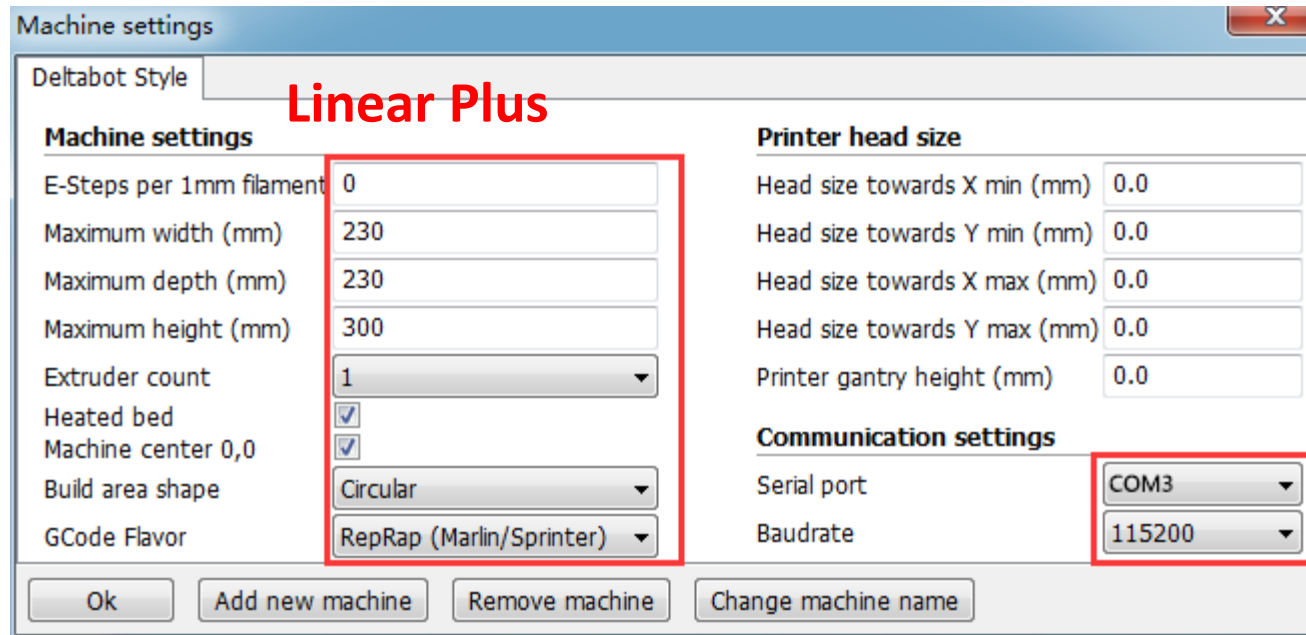


### Other operations:

- (1) Change viewing angle : right click the model, hole on and move the mouse.
- (2) Zoom in/out : scroll the mouse wheel.
- (3) Position change : left click on the model, hold on and drag the model to move.
- (4) After rotating the model, it is strongly recommended to click on the “Lay Flat” icon to ensure that flat portion of the model is well attached to the platform.

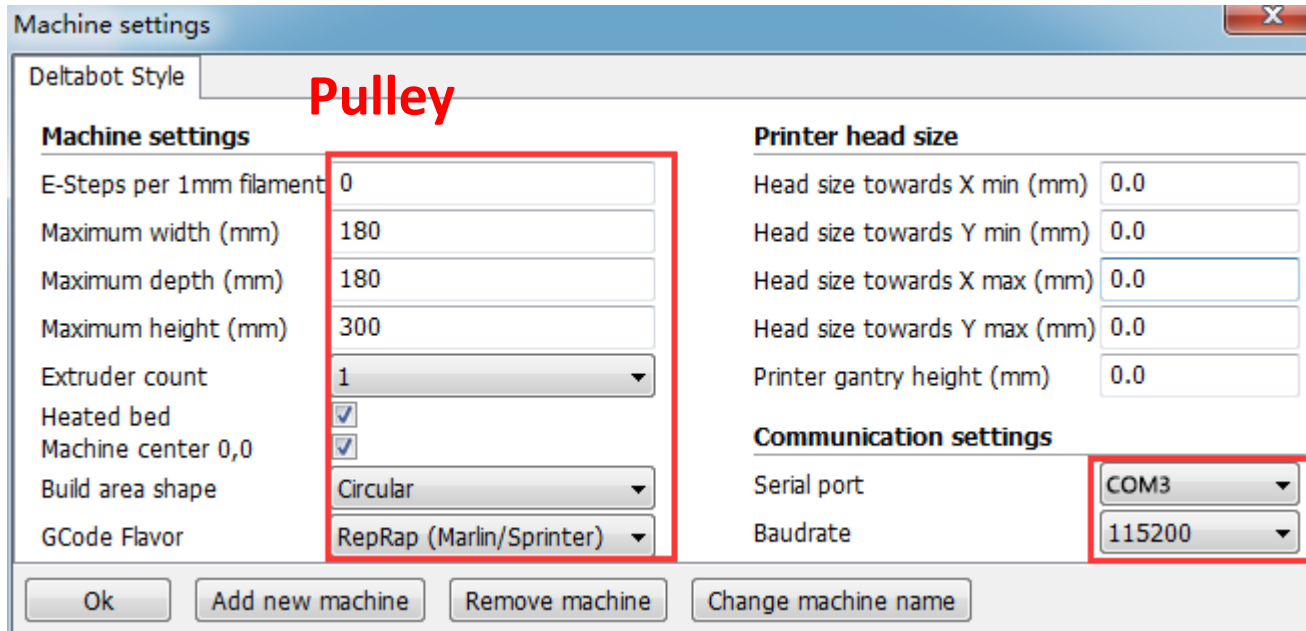


# Introduction to slicing software



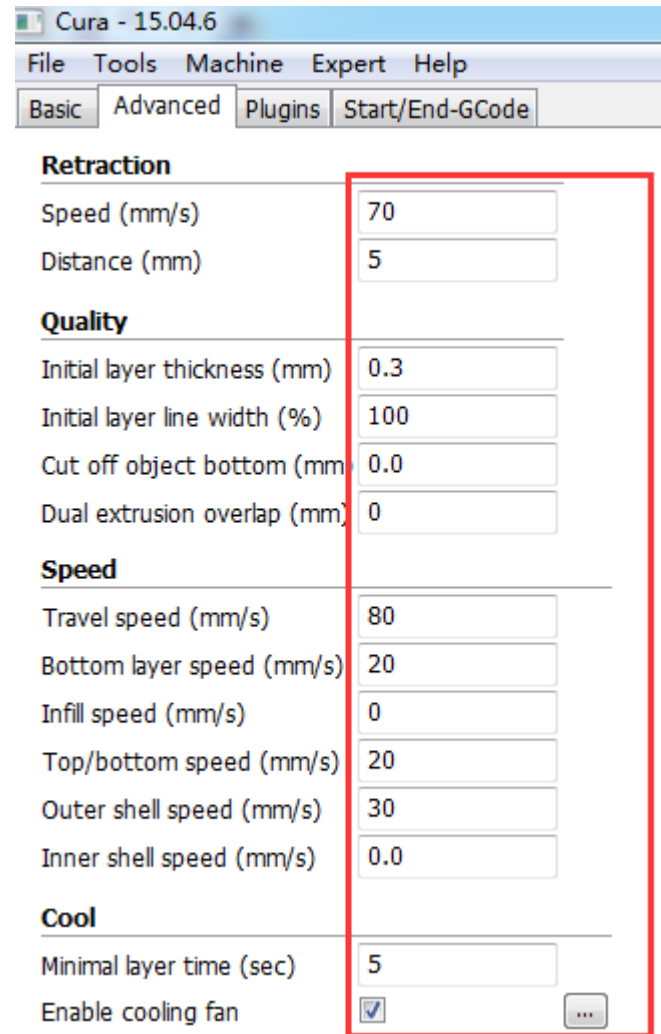
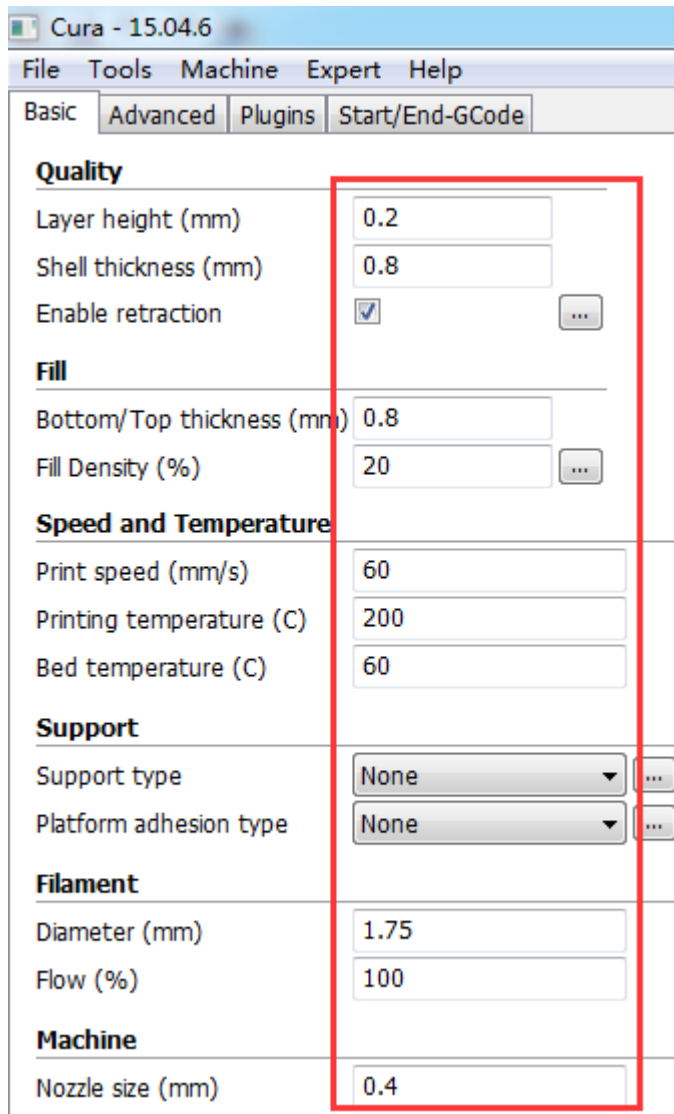
## 3. Cura settings

(1) In the menu bar, select "machine" → "machine settings". Please choose the same Serial Port (COM) as shown in your PC → Device Manager → Port (customers may have a different COMx other than the example COM3 here).



# Introduction to slicing software

(2) Click "OK" for the settings to return to the main interface, and then set the "Basic" and "Advanced" parameters separately, as shown below (Both the Linear Plus and the Pulley can be set to the following parameters):



# FAQ

## 1、 LCD malfunction (no power/blank)

- ① Ensure the machine is well connected to the power/PC.
- ② Ensure the wiring of LCD is correct (EXP1 to EXP1; EXP2 to EXP2).
- ③ Ensure the firmware has been uploaded. If not, LCD would show blank.
- ④ Adjust the brightness by rotate the small 'contrast' knob on the back of LCD.

## 2、 Motor malfunction (shaking/run opposite)

Please check with the A4988 driver to see if the AI cooling fin contacts with the pins. In this case A4988 is very likely damaged and need change.

## 3、 Off-line print abnormal

- ① Ensure the read/write of SD card is OK.
- ② Ensure the file format in SD card is Gcode instead of STL, and file name should be in English instead other languages.

## 4、 Print head malfunction (block/leakage)

- ① Block at the nozzle. Two possible causes: (1) low quality filament and (2) metal scrap inside the nozzle. Please clean the nozzle using cleaning screw or contact us.
- ② Block at the throat. Two possible causes: (1) insufficient cooling. Check the cooling fan; and (2) careless assembly. Ensure the tube has been well screwed down.
- ③ Block between the quick connector and the AI radiator. The reason is most likely insufficient cooling, so please check the cooling fan.

## 5、 Filament output abnormal

- ① No output. Two possible causes: (1) refer to Question 4; (2) insufficient heating for filament. Normally the printing temperature range of PLA and ABS is 180-200 and 210-240 degree C, respectively. Try to increase the printing temperature or improve the heat insulation of the printing head.
- ② Rough output. (1) Check with Question 4; (2) check with the extruder, especially the extrusion wheel and the extrusion bearing. Clean and adjust them if necessary.

## 6、 Print head shaking

- ① Ensure the screws on carbon fiber tubes are well connected.
- ② Ensure the clamp to fix the Al radiator is well fixed.
- ③ Check belt tensioners, pulley carriages/linear rails and the corresponding screws.



KOT022