

iNSTA3D
Dream Design Deliver

Quick Start Guide

INSTABOT

A Product of iNSTA3D TECHNOLOGIES



A product of iNSTA3D

www.myinsta3d.com

About iNSTA3D TECHNOLOGIES

iNSTA3D TECHNOLOGIES is shaping ideas by helping researchers, engineers and health experts expand human knowledge with the aid of advanced technology - 3D Printing. We are fuelling the next generation projects of innovation through our work in Automotive, Medical, Industrial, Architectural, Engineering and Education sectors. We're trusted by leading manufacturers and groundbreaking designers, makers, thinkers and doers.

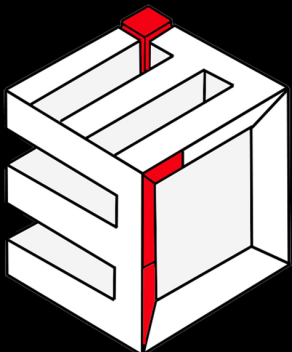
3D Printing has caught the attention of educators who are looking into ways to incorporate it into the classroom. Our vision acts as a tool to empower realistic illustration in classrooms. We focus on productive and creative learning process.

As a part of this, we provide professional level 3D Printing courses and workshops. We also help setting up innovation laboratory in educational institutions for a better learning environment.

We provide the most innovative & advanced 3D printers (FDM, SLA, DLP, SLS), 3D Pens in India. As an initiative to Make In India programme, we launch our own new 3d Printers, *iNSTABOT* series with higher specification.

Welcome.
Let's Get Started.
Welcome to the User Manual for the
iNSTABOT® Desktop 3D Printer.
The **iNSTABOT**
is super easy to use, but it's also packed
with brand-new features,
so even if you've used a
Desktop 3D Printer before, be sure to
read this manual all the way through.

MANUFACTURER
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Safety Instructions

Please read the safety instructions carefully before get started.



iNSTABOT 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 the extruded material may cause burns. Wait for printed objects to cool before removing them from the build platform.



iNSTABOT 3D printer includes moving parts that can cause injury.



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



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



The iNSTABOT 3D printer **MUST NOT** be exposed to water or rain.



The iNSTABOT 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.



In case of emergency, immediately turn off the iNSTABOT 3D printer.



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



Never leave the iNSTABOT 3D printer unattended during operation.



*Create
imagination
Build personality*



SPECIFICATION

Machine Type	: Delta (FFF) 3D Printer Kit
Build Volume (mm)	: 180 (Dia) x300 (H)
Resolution	: 100 to 300 Microns
Processing Material	: PLA, ABS and many more
Build Temperature	: 180 to 250 Degrees
Bed	: Auto level (Optional)
Speed	: 150 mm/sec
Filament size (mm)	: 1.75
Nozzle diameter	: 0.4mm
Software Specification	: Windows, MacOs, Linux
Input Format	: STI ,OBJ
Display	: LCD
Power Supply	: AC 100 - 240 V
Machine Dimension	: 300 (W) x 650 (H) mm
Weight	: 8.5 KG
Colours	: Black Grey Red White



Parts List

No.	Items/Quantity	No.	Items/Quantity
A01	Top triangle ×3	B01	XYZ Motor ×3 (with wire)
A02	Bottom triangle ×3	B02	Print head set ×1
A03	Effector ×1	B03	4010 fan ×1 (with wire & end)
A04	Horseshoe fixture ×1	B04	4010 air blower ×1 (with wire & end)
A05	Radiator cover ×1	B05	Limit switch ×3
A06	Air nozzle ×1	B06	Wire for limit switch ×3 pairs
A07	Belt tensioner ×3	B07	Wire terminal for limit switch ×3
A08	Stop blocks ×6	B08	Extrusion motor ×1
A09	Carriage ×3	B09	mainboard ×1
A10	Extrusion bearing holder ×1	B10	Al-fin ×5
A11	Extrusion fixture ×1	B11	A4988 driver ×5
A12	Extruder rack ×1	B12	LCD 2004 ×1 (with pin board & wire)
A13	Shaft sheath ×1	B13	USB wire ×1
A14	Mainboard holder ×1	B14	Power adaptor ×1
A15	LCD cover ×1	B15	SD card ×1
A16	Limit blocks for print platform ×6		
C01	M5*25 screw ×9	D01	240mm Al-extrusion ×9
C02	M3*20 screw ×9	D02	680mm Al-extrusion ×3
C03	M3*16 screw ×17	D03	Idler wheel ×3
C04	M3*12 screw ×1	D04	Synchronizing wheel ×3
C05	M3*10 screw ×8	D05	Carbon fiber tube set ×6
C06	M3*8 screw ×50	D06	450mm Linear rail ×3
C07	M2.5*12 screw ×11	D07	Pulley wheel (Bearing) ×9
C08	M2*5 screw ×8	D08	4.5m Synchronous belt ×1
C09	Ø4-7-0.5 washer ×2	D09	Belt tension spring ×3
C10	M3 flange nut ×18	D10	Extrusion wheel ×1
C11	M4 square nut ×67	D11	Extrusion bearing ×1
C12	M5 hex nut ×9	D12	Extrusion spring ×1
C13	M4 hex nut ×3	D13	M6 Quick connector ×1
C14	M3 hex nut ×16	D14	0.6m PTFE feeding pipe ×1
C15	M4*8 screw ×6	D15	0.8m Strap ×1
C16	M4*10 screw ×59	D16	PTFE washer ×4
C17	M4*12 screw ×1	D17	Ø200mm Glass plate ×1
C18	M4*25 screw ×3		

Mechanics

Fasteners Listing



Note: A flat surface is recommended for the assembly. Hex keys are available within the package. Take care of the scrap when unpack Al-extrusions and keep it away from children.

1. Top and bottom triangle

Step 1. Firstly, hang but not tighten 5 pairs of C16 and C11 onto A01 as shown in Fig 1. Then push an Al-extrusion (D01) through two screws along A01 and tighten the corresponding screws. Lastly, fix one pair of C13 and C18 onto A01 as shown in top-left.

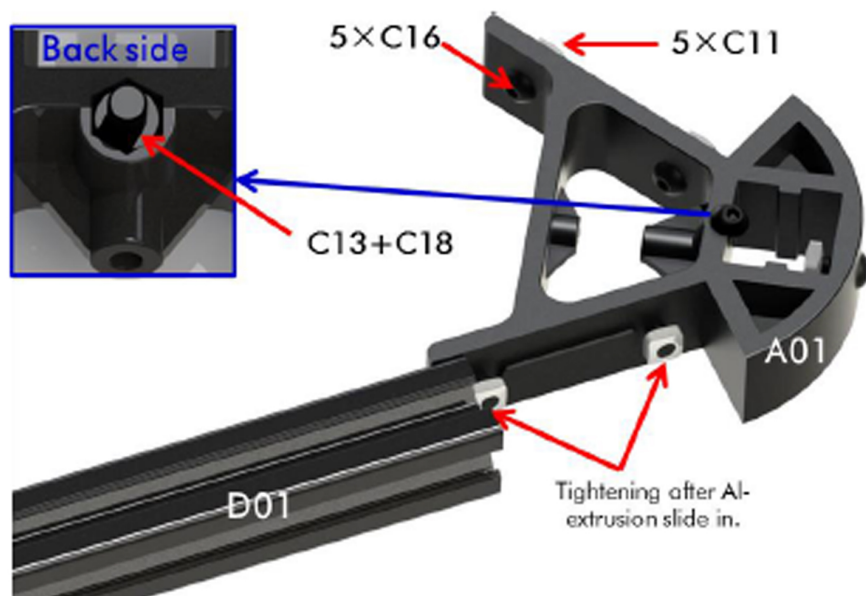


Fig 1

Step 2. Place 3 pieces of assembled A01 and D01 on a flat surface with back side face down, as shown in Fig. 2. Then, follow the blue arrows, slowly push forward those 3 parts to

form a triangle and tighten the corresponding screws (red arrows).

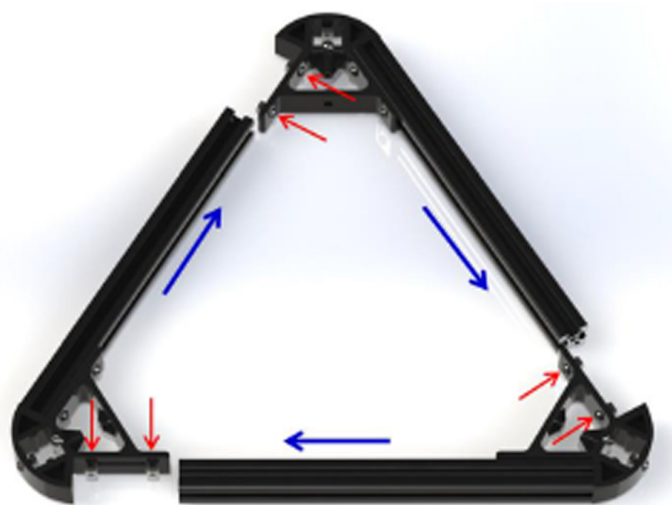


Fig. 2

Step 3. Fig. 3 shows the assembly details of one of the three corners of the top triangle.

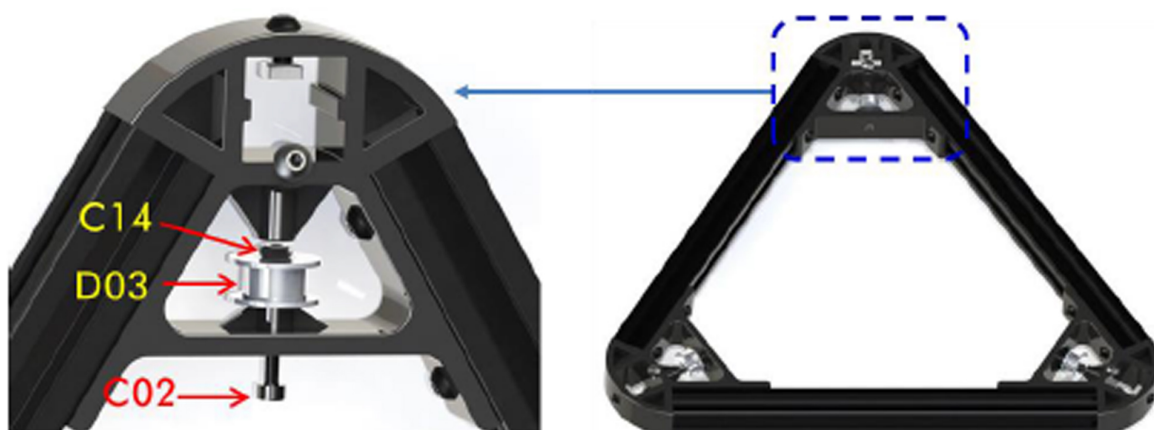


Fig. 3

Step 4. The assembly of bottom triangle is the same as the top, except 10 pairs of C16 and C11 and 2 pairs of short A1-extrusion are used for A02, which is show in Fig. 4.



Fig. 4

Step 5. After 3 pieces of assembled A02 are ready, push them forward simultaneously to form the bottom triangle and then tighten the corresponding screws, just as Fig. 5 shows.

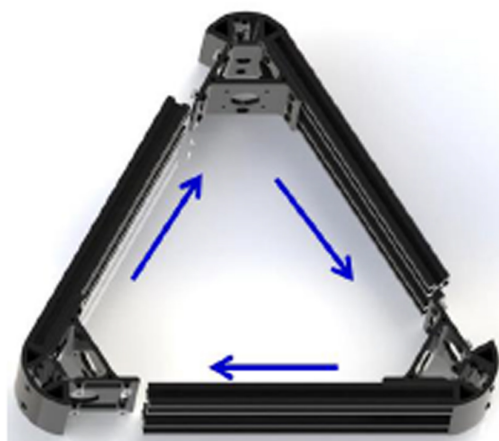


Fig. 5



Fig. 6

Step 6. Fig.6 shows the assembly of 3 stepper motors. After assembly, using C06 to fix those motors to each corners of the bottom triangle as demonstrated in Fig. 7. Make sure the sockets of the motors face up.

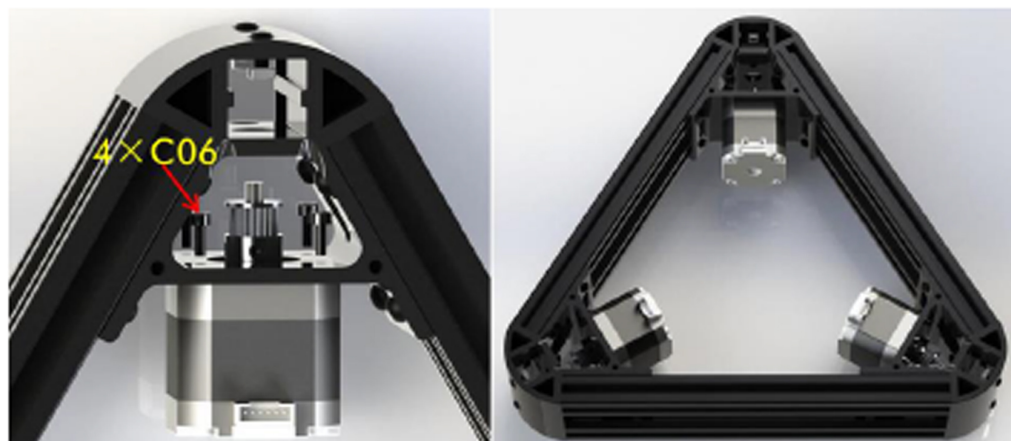
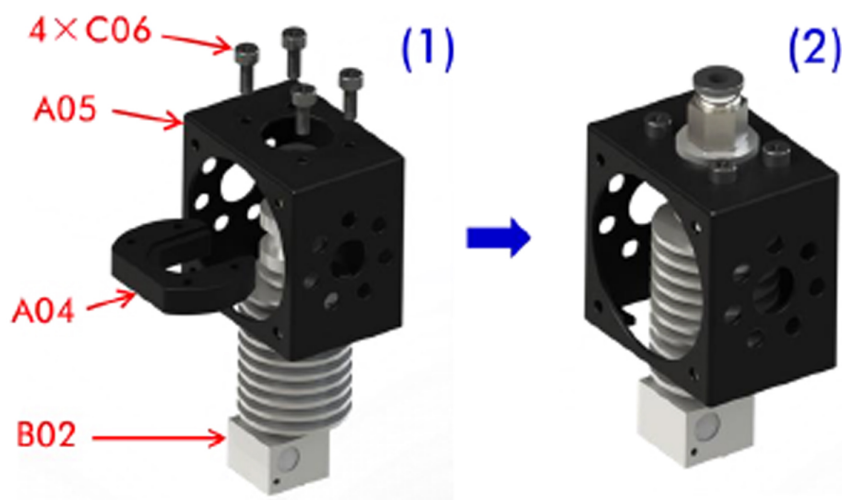


Fig. 7

2. Effector

Step 1. Before installation, detach the heat rod and thermistor from the hot end set. Then install the Hot End to the radiator cover (A05) by a horseshoe (A04), as shown in Fig 8. Leave the C06 screws untightened in order to adjust the hot end angle later if necessary.



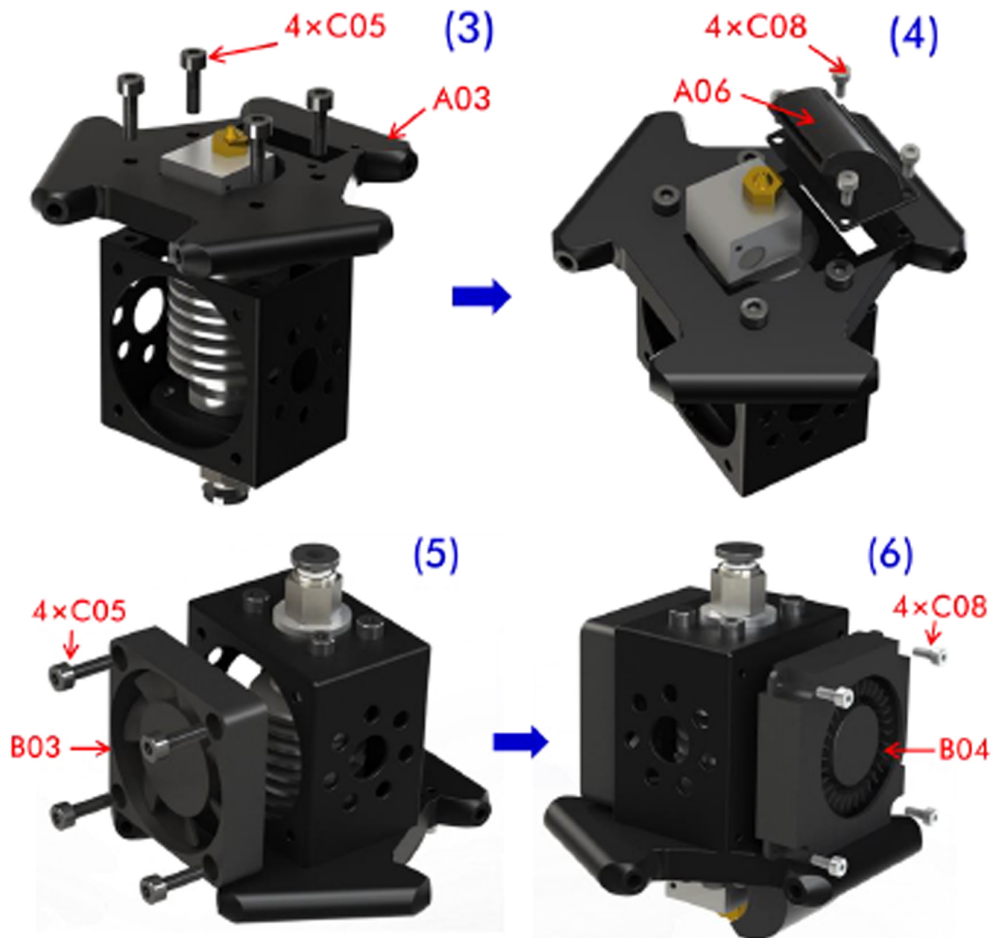


Fig. 8

Step 2. As shown in Fig. 8 (3) and (4), find the suitable angle to fix the Hot End into A03. Then fix the heat rod and thermistor back. After, use 4 pieces of C08 to fix the air nozzle (A06). Lastly, fix B03 and B04 (fans) to the correct side of the radiator cover.

Step 3. Fix 6 carbon fiber tubes (CFT, D05) onto A03 using C03 screws, as shown in Fig. 9.

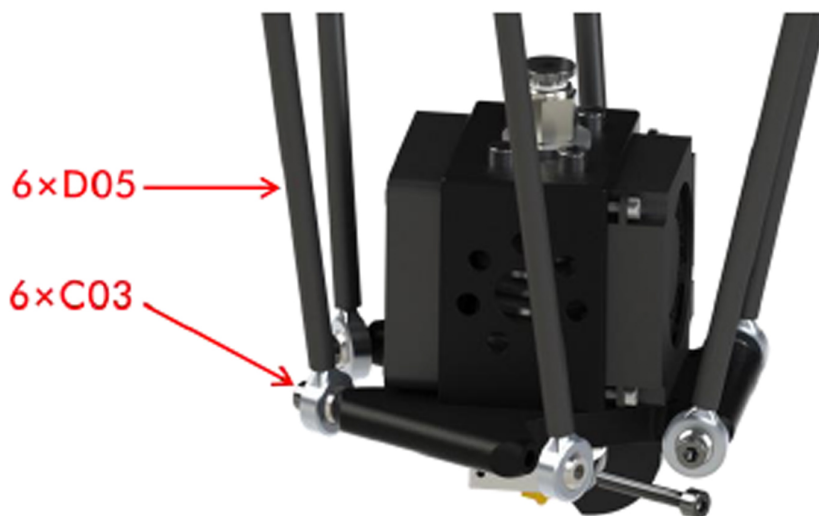


Fig. 9

Step 4. Fig. 10 shows the assembly of 3 belt tensioners which connected to the CFTs. Please note the suggested height of the top screws (C07) is 8mm.



Fig. 10

3. Slide guide

The operation of effector depends on the linear motion of each belt which is connected to stepper motor. The type of motion guide is divided into Linear and Pulley. The assembly of those two types will be introduced in the following section.

First of all, find 3 pieces of long Al-extrusions and fix them from the upper side to the bottom triangle as shown in Fig. 11. If choose the wrong side, the Al-extrusion would not fit in. Next, tighten the corresponding screws at each corner which is shown by red arrows.



Fig. 11

Pulley Version

Step 1. As shown in Fig. 15, fix 3 pulley wheels (D07) to the carriage (A09) using 3 pairs of C01 and C12. Insert C14 into the dash-circle area and fix a C04 screw from the side. Do not over tighten or twisting the carriage. Do the same to the rest of 2 carriages.

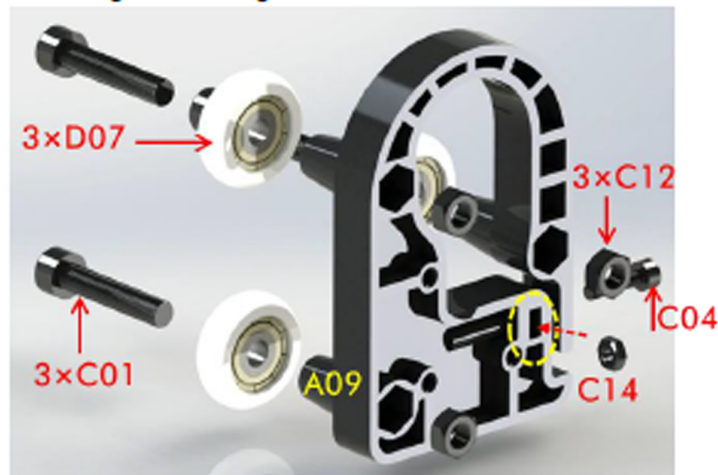


Fig. 15

Step 2. As shown in Fig. 16, fix the prepared belt tensioners to the carriage sets using C04.



Fig. 16

Step 3. Slide down those 3 carriages along with each Al-extrusion. Then fix 3 stop blocks using C16 and C11 and the suggested distance from the stop block to the top is 30mm.



Fig 17

4. Main frame

The assembly of main frame and limit switches is the same for both Linear and Pulley version. Here we take Linear version for example.

Step 1. Fix the limit switches (B05) to each of the stop blocks as shown in Fig. 18.

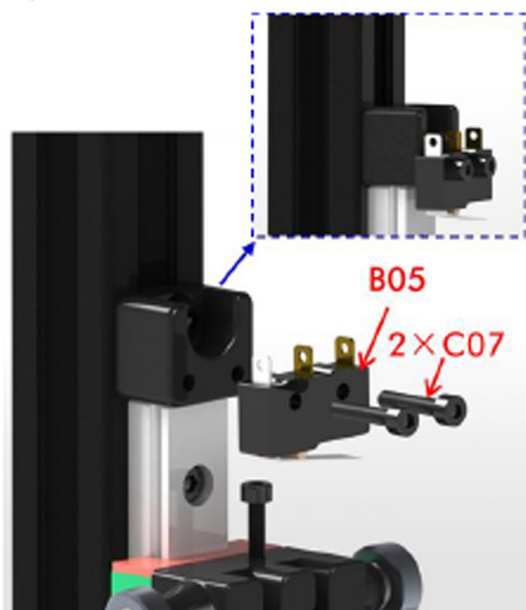


Fig. 18



Fig. 19

Step 2. As shown in Fig. 19, install the top triangle frame to the main structure. Meanwhile adjust the screws (red arrows) to level the upper surface of the triangle frame with the top of each AI-extrusion. Fasten the 3 screws on the side (green arrow) after leveling.

Step 3. Install one end of the wire (B06) to the limit switch through the top triangle frame (no positive and negative). Lead the other end of the wire passing through the hole of the AI-extrusion and the holes of the bottom triangle, which is shown in Fig. 20. After that, fix

the bottom end of B06 into the terminal of B07. Do the same to the rest of limit switches.

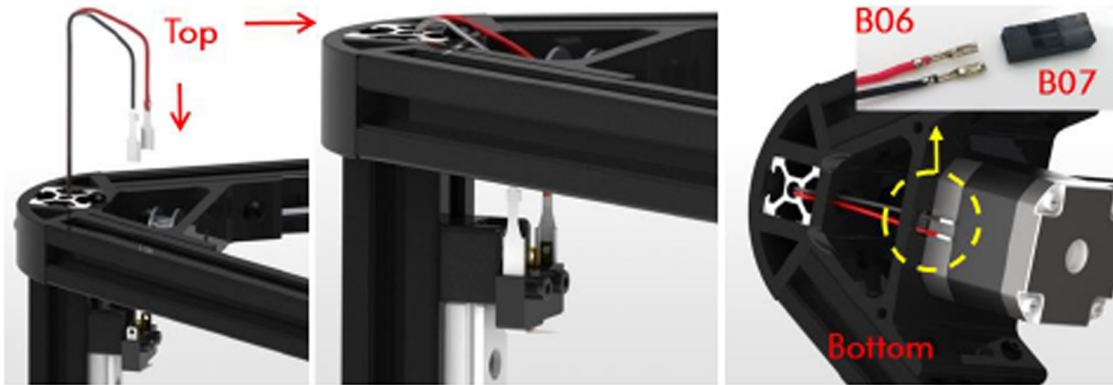


Fig. 20

5. Belts

The assembly of belt is the same for both Linear and Pulley version. We take the Linear version for example. Divide the belt into 3 equal parts. Fix one end of a belt onto the belt tensioner as shown in Fig. 21-1. Thread the belt through the top guiding wheel, then the bottom synchronizing wheel, and lastly fix the other end of the belt back to the belt tensioner, Fig. 21-4. Do the same to the rest of 2 belt parts. If necessary, use the belt tension spring (D09) to adjust the tightness of the belts.

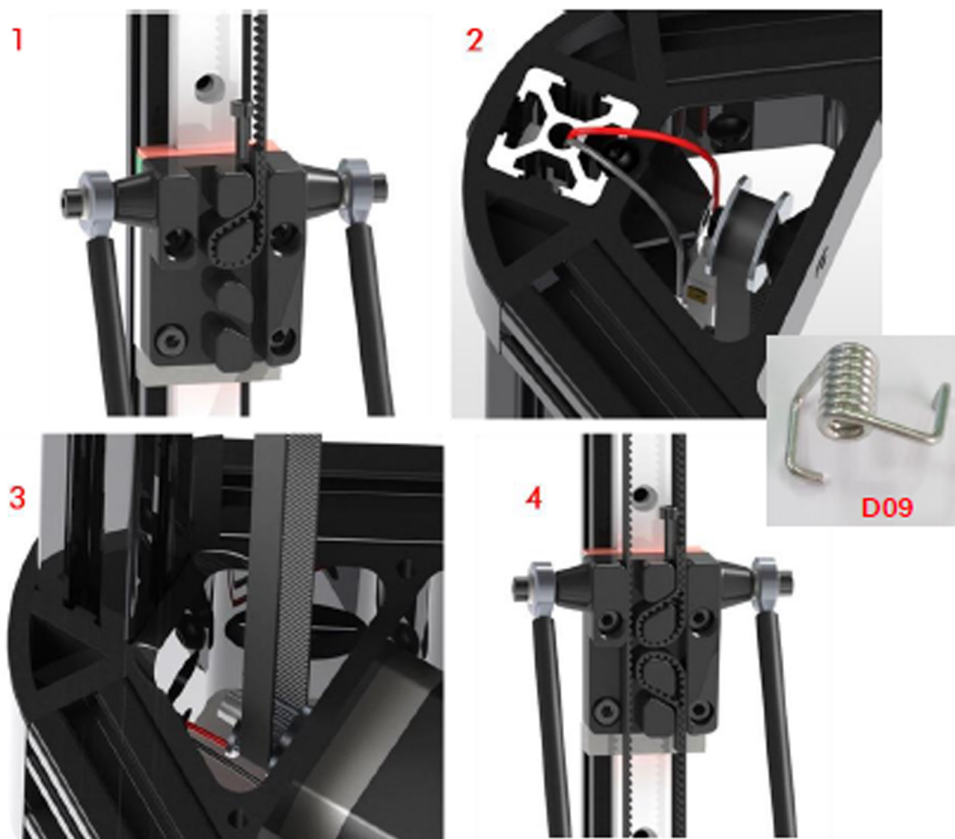


Fig. 21

6. Extrusion system

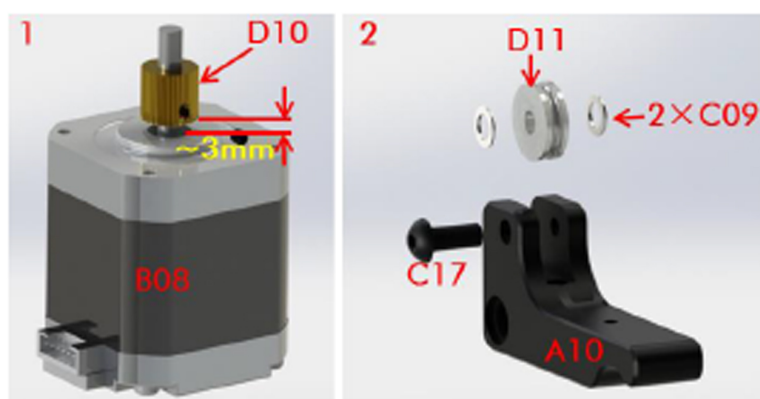


Fig. 22

Step 1. As shown in Fig. 22, firstly fix the extrusion wheel (D10) onto the shaft of the extrusion motor (B08). Make sure the fastening screw is facing the plane of the shaft. Notice the distance between the extrusion wheel and the motor is about 3mm. Next, install the extrusion bearing with 2 washers onto the bearing holder as shown on the right of Fig. 22.

Step 2. The assembly details (from right to left) of the extruder are shown in Fig. 23. The socket of the extrusion motor is suggested to face down (blue dash circle).

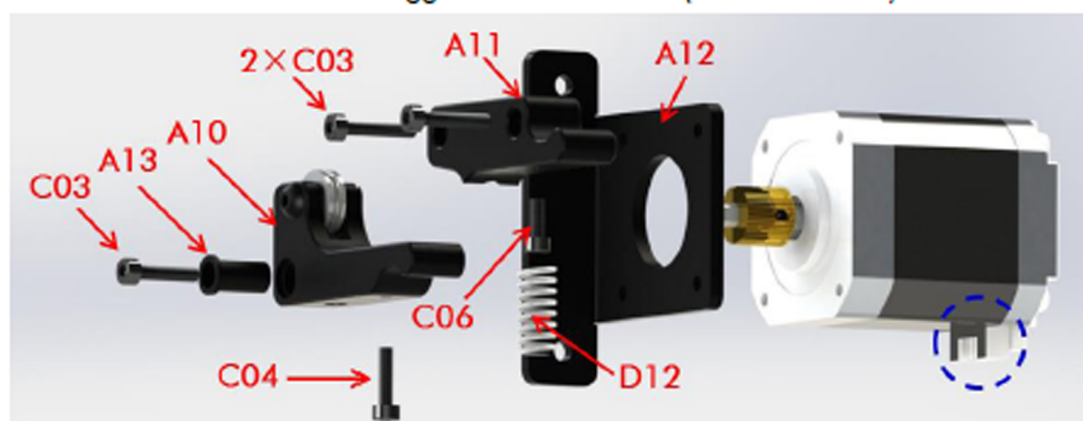


Fig. 23

Step 3. As shown in Fig. 24, lie down the main frame and choose one of the 3 long Al-extrusions to fix the extruder on by using 2 pairs of C15 and C11. The position of the extruder should be a bit lower from the middle, which could be seen in the cover page. Next, find the quick connector (D13) and the feeding pipe (D14) and fix them onto extruder.

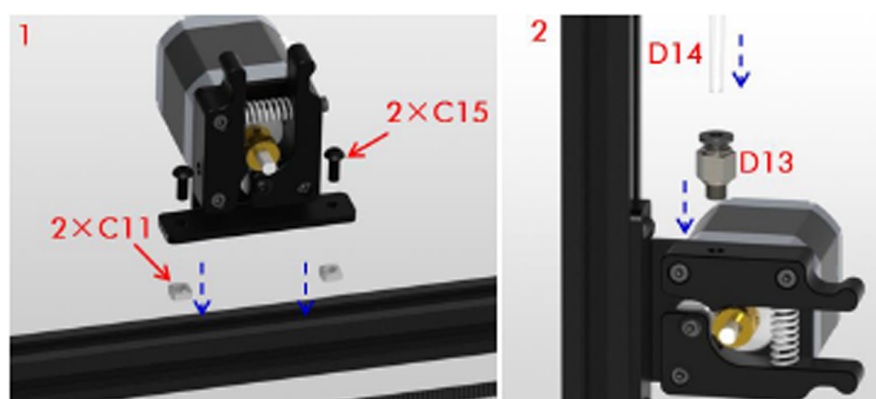
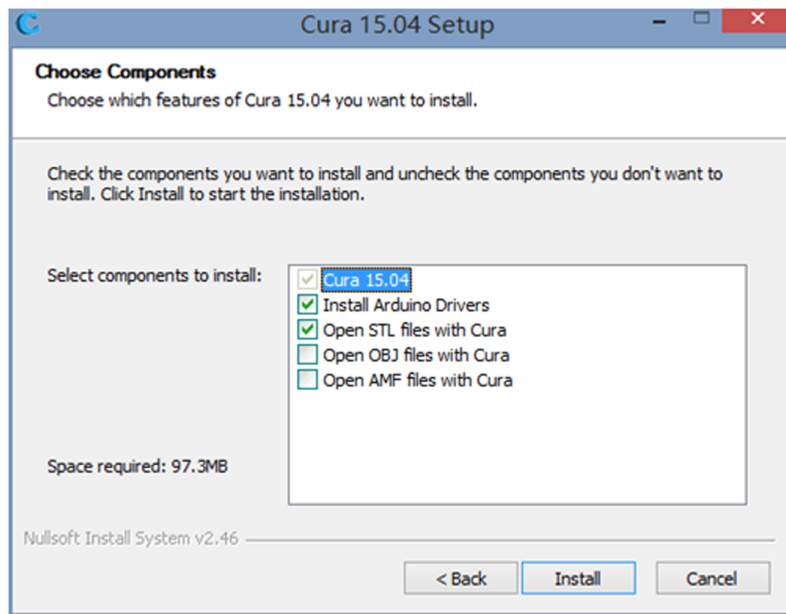


Fig. 24

Installation of CURA

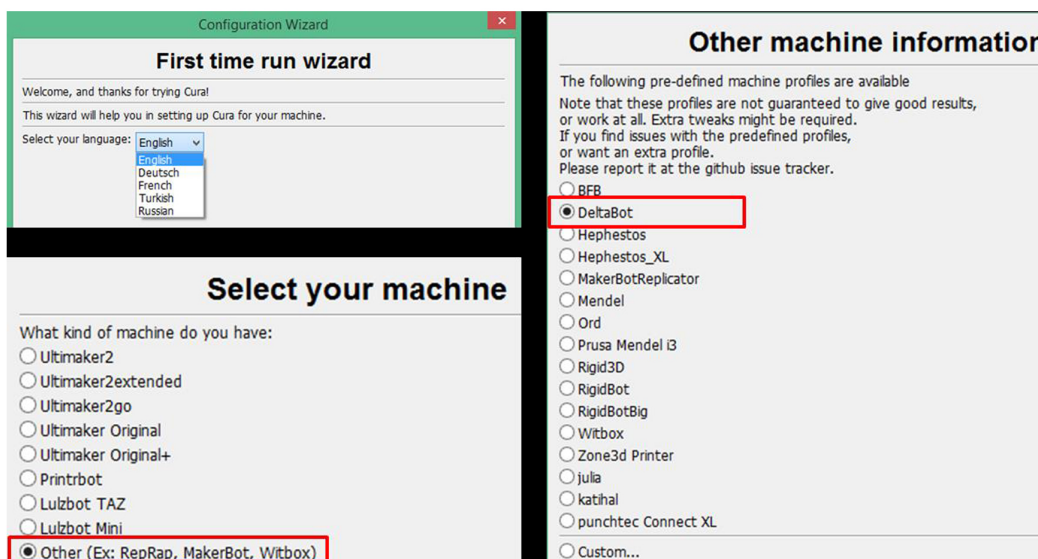
Step 1. Installation of the slicing software.

Cura is used for example. Double click 'Cura_15.04' to proceed with the installation. When the dialogue appears you may tick all the boxes as shown in Fig.



Step 2. Configuration.

When finishing the installation and opening 'Cura' for the first time, a configuration dialogue would appear. Choose the 'language' that suits you and click 'Next' if necessary. When come across 'Select your machine', please choose 'Other' and hit 'Next' and choose 'DeltaBot' in the following dialogue, which is shown step by step in Fig. Lastly, click 'Finish' to complete the configuration and enter the home interface of Cura.



Installation of CURA (Continued...)

Step 3. Printing parameter settings.

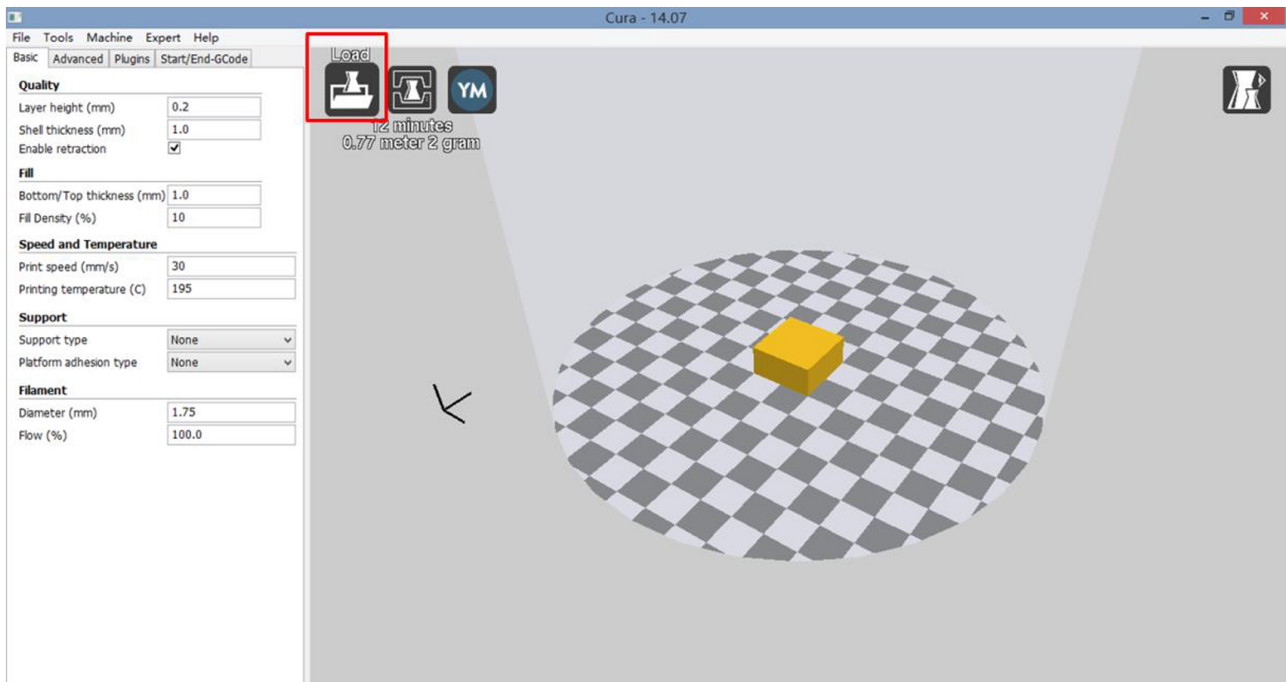
At the home interface of Cura, click 'Machine' and in the drop-down menu choose 'Machine settings' to open the setting interface as Fig. shows. Change the maximum width, maximum depth and maximum height into 240, 240 and 300 respectively. The serial port can be AUTO, or choose the right port when you have several devices connected. The baud rate is suggested to be 250000. Then click 'OK' at the bottom left, to return to home interface.

Next, as shown in Fig. below, click 'Basic' and 'Advanced' respectively on the top left in home interface of Cura to change the parameters to suitable values one by one. Note: the suggested parameters in Fig. may be varying depend on different models of iNSTABOT.

Installation of CURA (Continued...)

Step 4. Print.

To experience the very first print, please load the test model '20×20×10' and then click the 'Print with USB' icon on top, as shown in Fig. below. In order to minimize the instability from the PC and USB port, it is strongly suggested to save the model in Cura as Gcode file into SD card and insert the SD card to 3D printer to print offline.



Printing Parameters:

- Layer Height
- Shell Thickness
- Fill Density
- Printing Speed
- Print Temperature
- Support Type
- Platform adhesion
- Filament Dia
- Filament Flowrate
- Retraction Speed and Distance
- Travel Speed
- Infill / Top & Bottom layer speed / Shell speed
- Cooling Fan
- Plug - ins