



FORMBOT



# Assembly & Operation Manual

## Marathon



Marathon, a 3D printer that embodies endurance and reliability. With its seamless performance and steadfast precision, Marathon tirelessly transforms your boldest creative visions into vibrant reality.

**VIVEDINDO**

Designed by Dr. Ing. Dan Andrei Marinescu

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# 1 Introduction

**Marathon** is an advanced 3D printer featuring a direct extrusion system, closed frame, high-temperature, and high-flow hotends, enabling successful completion of even the most challenging printing tasks. As an **IDEX 3D printer**, it's ideal for **dual material** printing, **duplication**, or **mirroring** printing scenarios. Regarding electronics, this printer is equipped with a 32bit Mainboard, TFT-Control screen and WiFi.

The printer is made of sheet metal parts and 3030 aluminium profiles which make the whole structure very sturdy and the printing bed is driven by 3 independent stepper motors with ball screws.

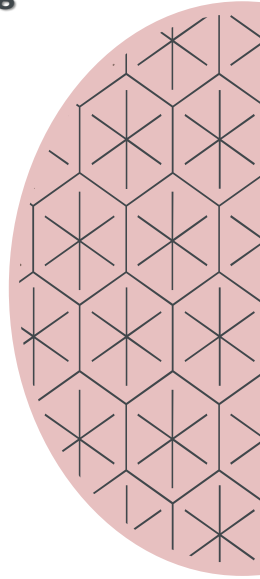
The printing volume, depending on the printing scenario, is as described below:

**Single mode:** 335x300x290mm

**Dual mode:** 280x300x290mm

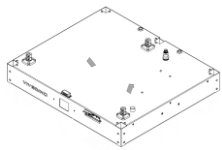
This printer is delivered in the form of a **KIT**. The assembly consists on putting together pre-assembled modules, for this being needed only to accomplish very simple assembling steps by using common tools. For the whole putting together are necessary something around 120 minutes.

This Manual is available for downloading on the Formbot internet site: <https://www.formbot3d.com/>

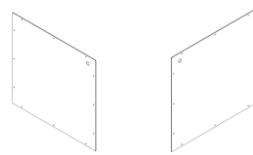


# 2 What is inside the box

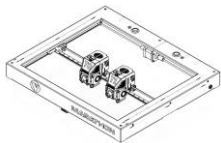
Base



Side Panels



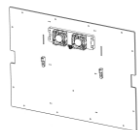
Top Frame



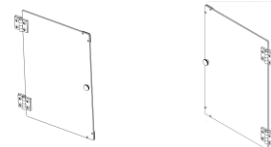
Print Bed



Back Panel



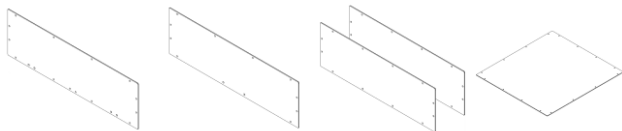
Doors



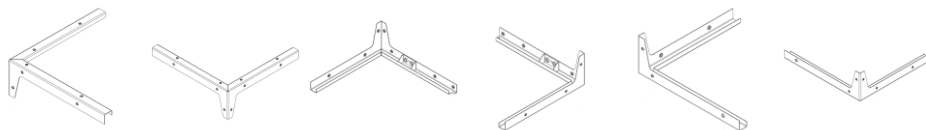
Pillars



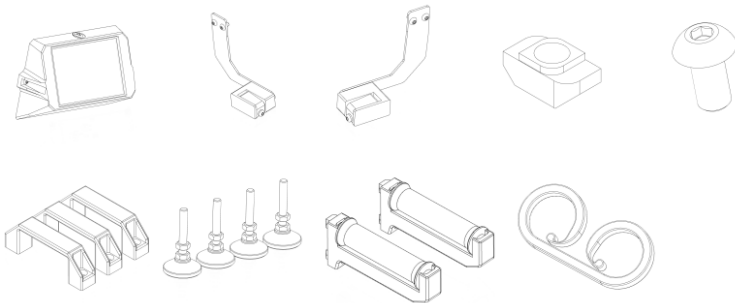
Top Hut Panels



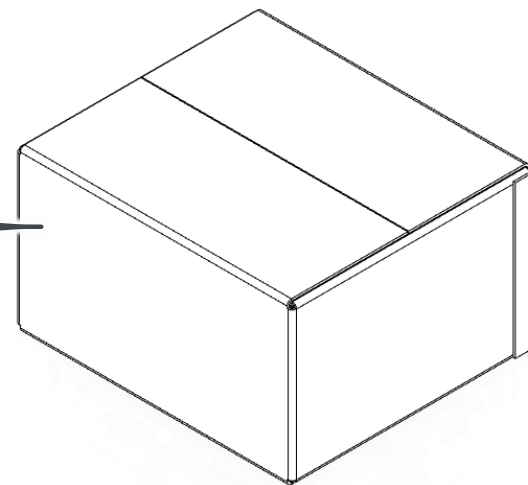
Top Hut Frame



Miscellaneous



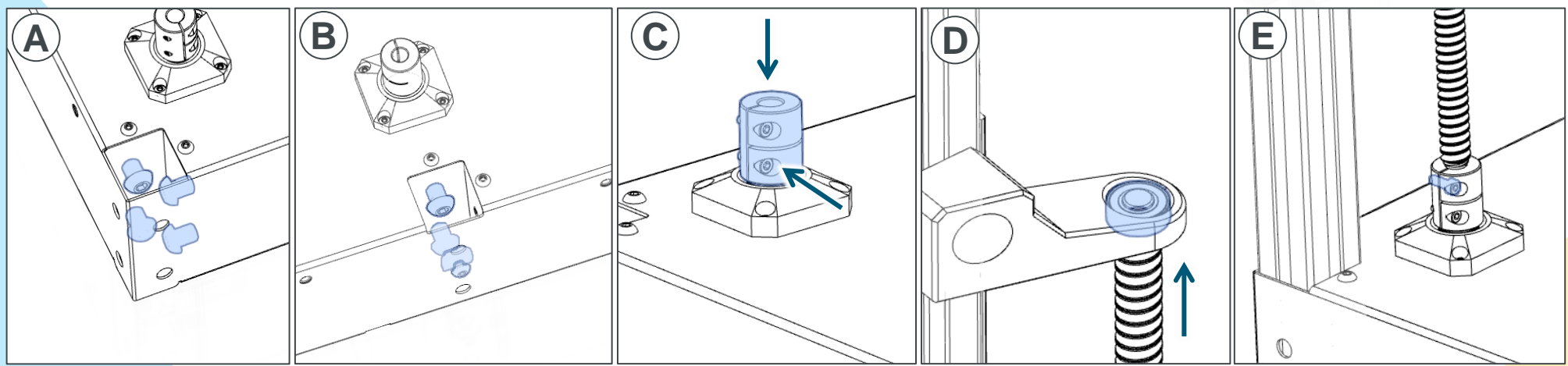
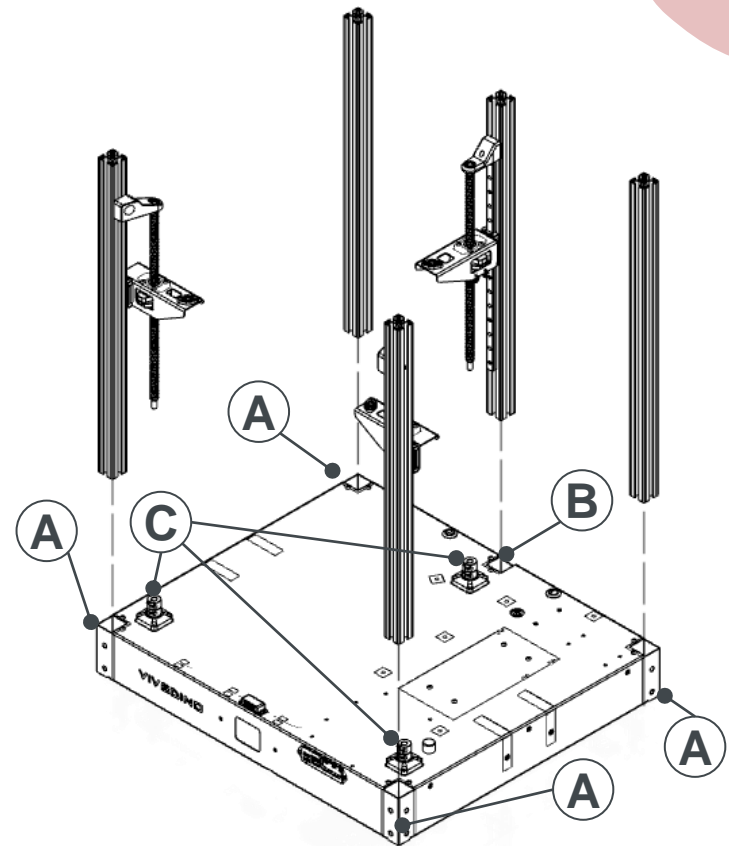
\*Depending on the market, the printer may be shipped in one or two separate boxes.



# 3.1 Pillars

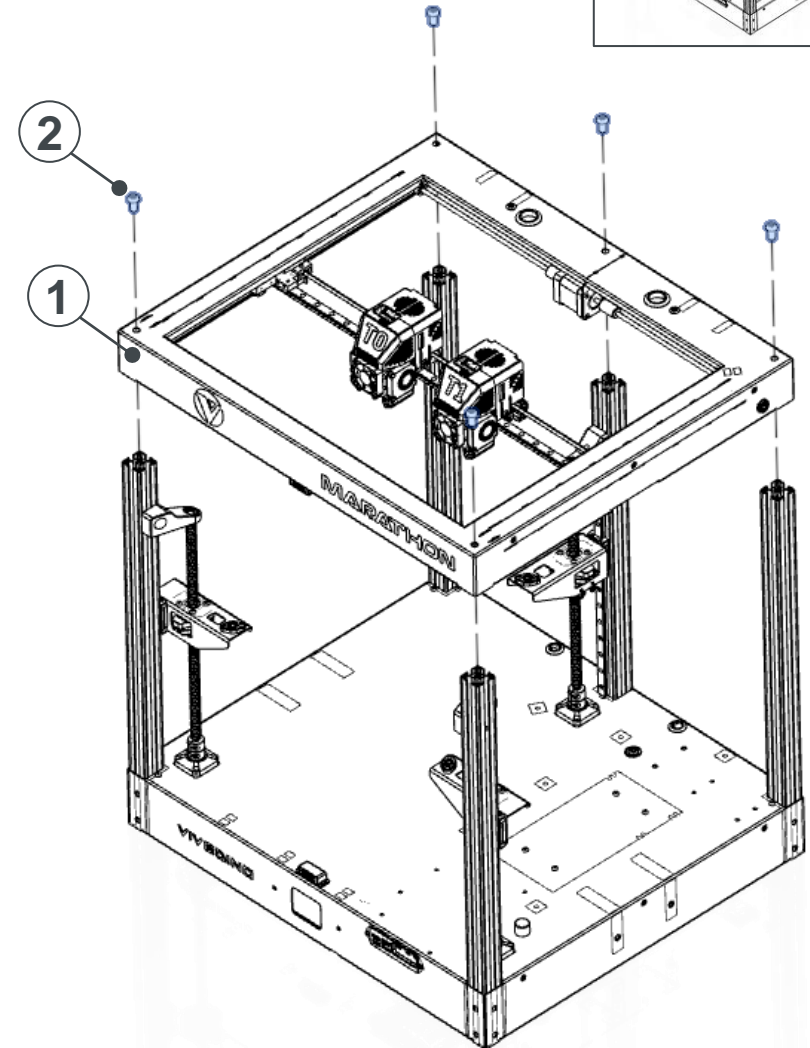
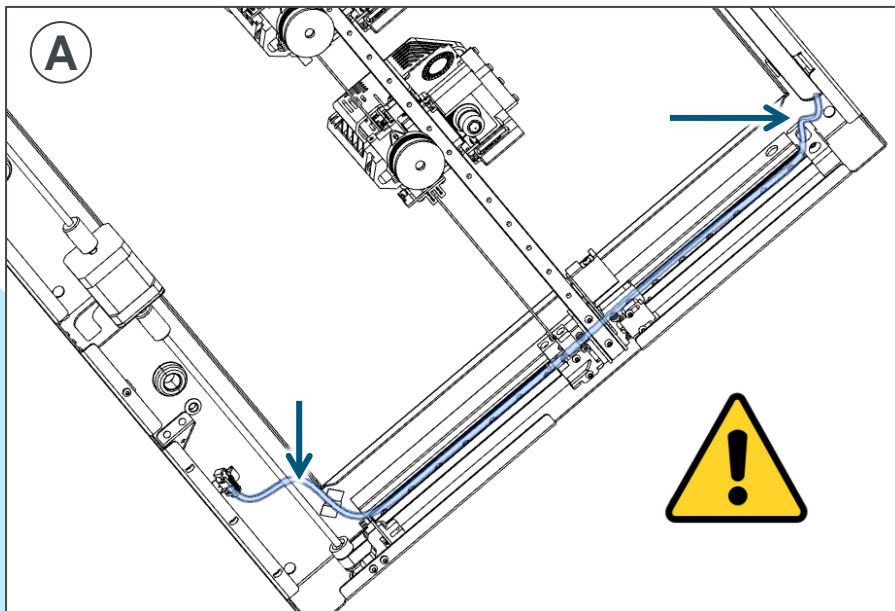
- Lay the base of the printer on a flat surface.
- There are a total of 5 pillars in the package that need to be assembled in this step.
- Insert each pillar into its designated place as shown in the picture.
- Pay attention to which pillar goes where!
- At each corner, there are 4 screws you have to loosen. They are meant to secure the pillars – refer to image A.
- For the pillar from the backside in the middle, there are 2 screws and one M5 screw with a T-Nut used for fixation – refer to image B.
- Make sure that the shaft couplings lay in contact with the flat bearing below. If not. Adjust – refer to image C
- Once the pillars are in their designated places and aligned with the passing holes, insert an Allen key and firmly tighten the securing screws.
- Make sure that the ball screws tip goes also inside the upper bearing. If not slide the ball screw upwards – refer to image D
- Securely tighten the screws on all three shaft couplings – refer to image E.

**⚠ Do not remove the packaging material that secures the Z-axis carriages in place before assembling the pillars. The packaging is designed to keep the carriages immobilized, preventing them from sliding out of the rail !**



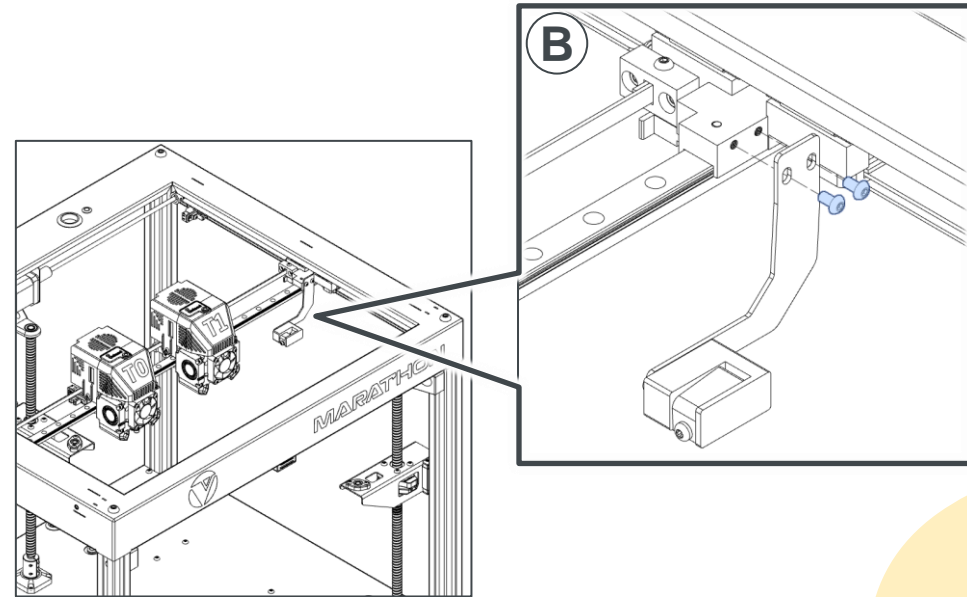
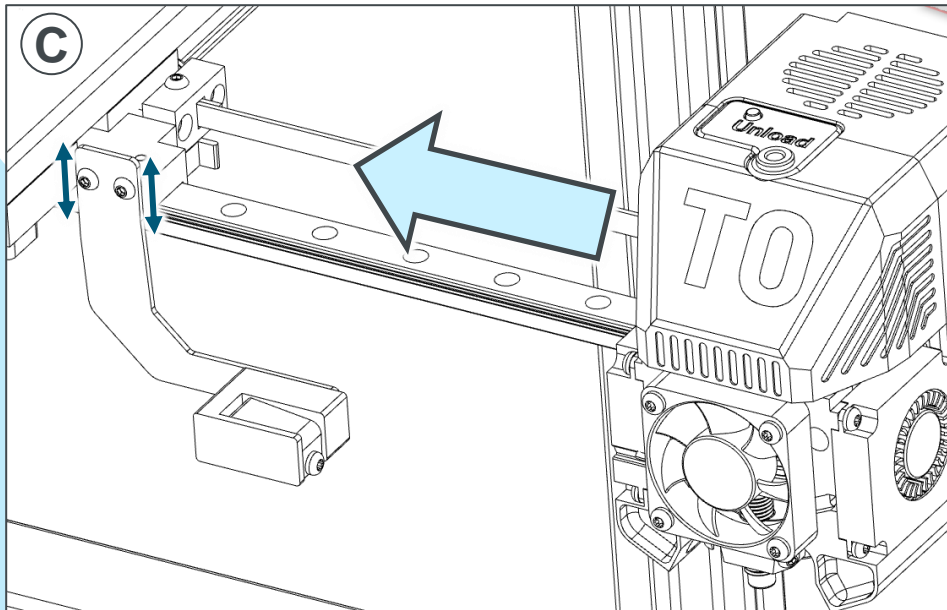
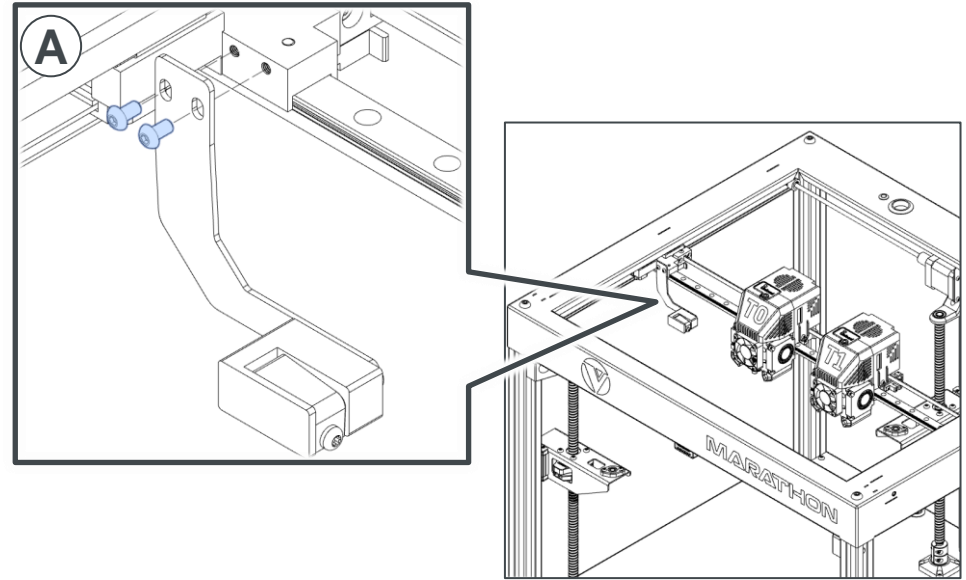
## 3.2 Top Frame

- Place the printer on a flat surface with the pillars facing upwards.
- **Make sure that there is no risk to pinch the LED wire during the assembly of the top frame** – refer to image A.
- Take the top frame and slide it over the pillars at the top, as shown -- ①
- Ensure that it aligns correctly over all five pillars.
- Using five M8 screws and an Allen key, firmly tighten the top frame in place -- ②



# 3.3 Oozing blockers

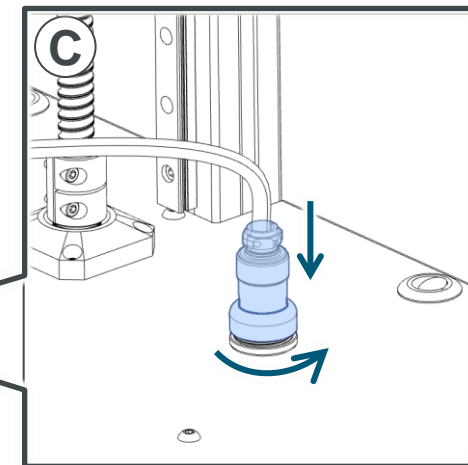
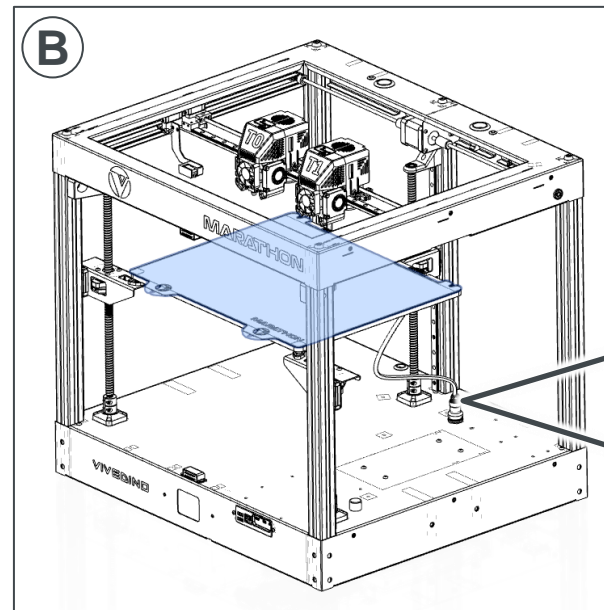
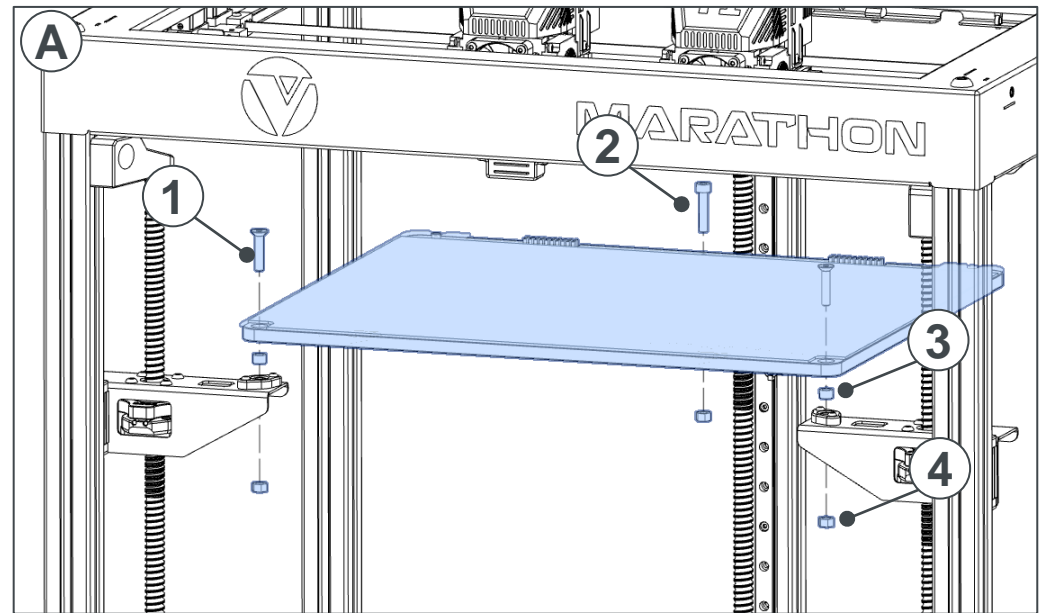
- Take oozing blocker for the side where you intend to install it.
- Using two M3x6 screws and an Allen key, fixate it in its designated place as shown but **leave the screws slightly loose** -- refer to [image A](#) and [B](#)
- Move the print head to its park position.
- Align the oozing blocker so that the sheet metal piece makes contact with the nozzle -- refer to [image C](#)
- Tighten the two M6 screws securely.
- Repeat the above described process for the second extruder.





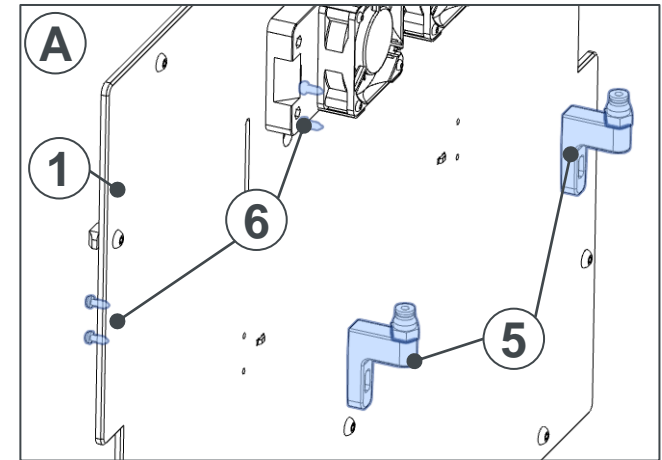
# 3.4 Print bed

- By manually turning the Z-axis stepper motors, put the print bed brackets at approximately the same level.
- Remove the PEI print surface.
- Lay the bed inside the printer and fixate it place -- refer to image A:
  - At the front there are used sunken head M5x25 screws ① and at the back cylindrical head M5x25 screw ②
  - Spacers will be inserted between the print bed and the brackets ③
  - From underneath, secure the screws using hexagonal nuts. ④
- To secure the print bed in place, you will need an Allen key and a wrench.
- Put the PEI print surface back on the print bed -- refer to image B
- Connect the print bed cable to the plug from the printer base -- refer to image C
- **Manually turn the Z-axis stepper motors to lower the print bed brackets to their lowest position, until the ball screw nut lays in contact with the shaft coupling.**

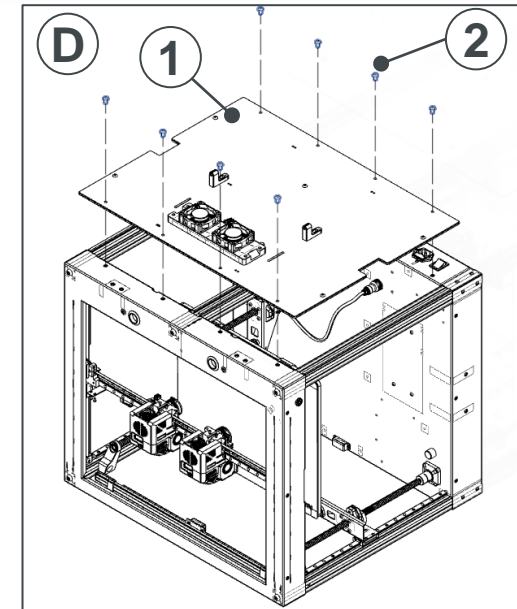
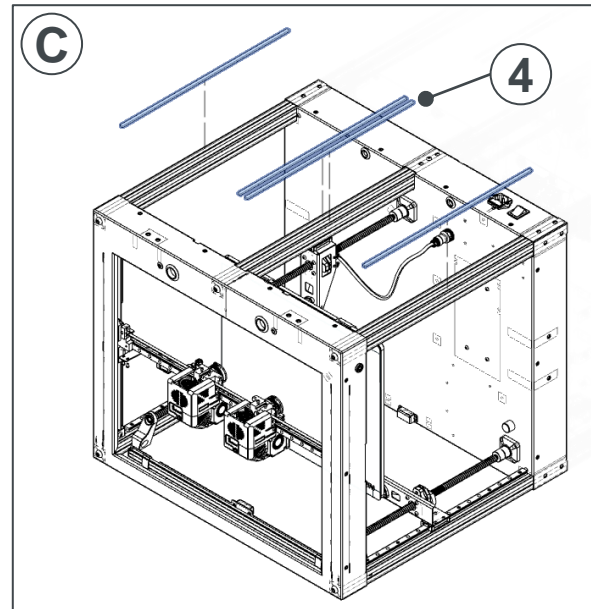
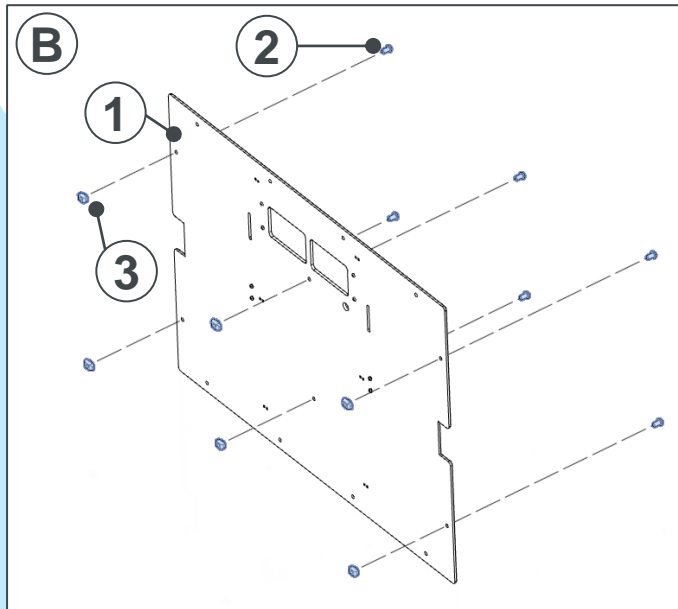


# 3.5 Back panel

- Take the back panel ① and assemble the fixations for the PTFE-Tubes ⑤ as indicated using self tapping screws ⑥ -- refer to image C
- Pre-assemble the M5x10 screws ② and T-Nuts ③ as indicated -- refer to image AB
- Leave the T-Nuts loose for now !
- Lay the printer with its front face on a flat surface.
- Add foam strips ④ on the aluminium profiles as shown -- refer to image C
- Place the back panel ① on the rear side of the printer and ensure that all the T-Nuts have entered in the channels of the aluminium profiles.
- Use an Allen key to secure the back panel with M5x10 screws ② along both its upper and lower edges as indicated -- refer to image D
- Proceed to tighten all the remaining screws.

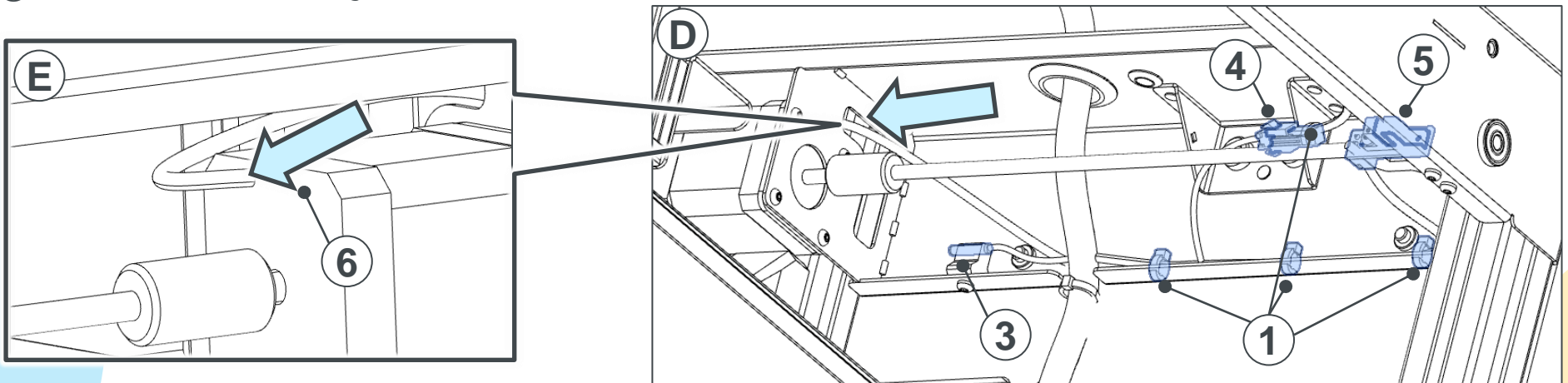
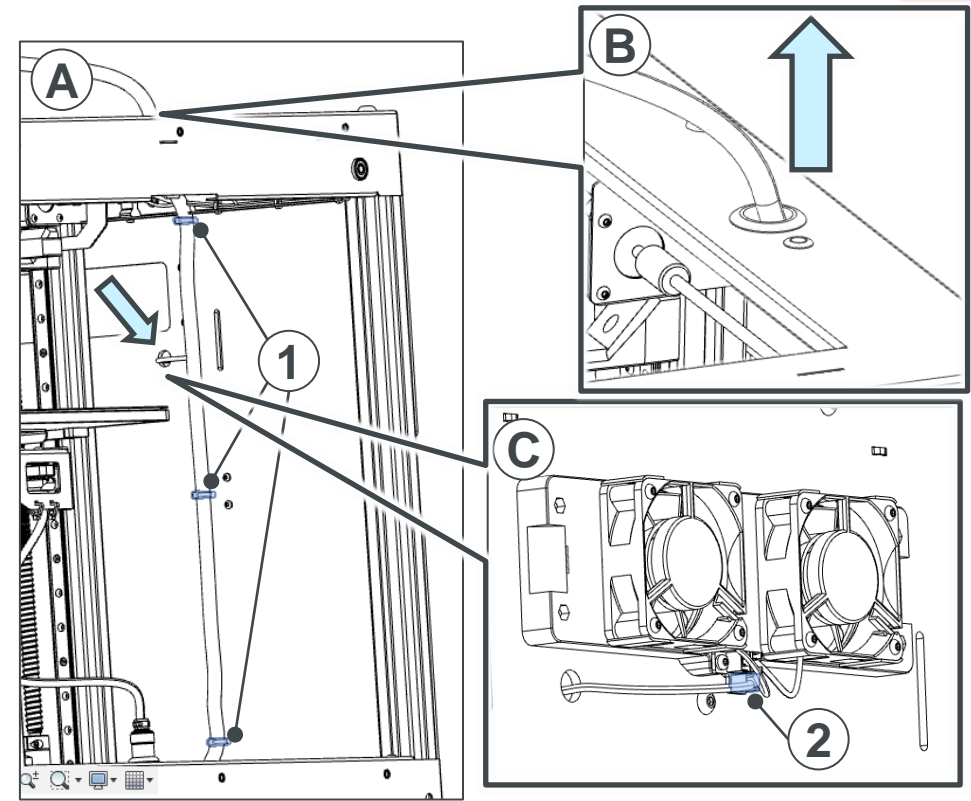


**⚠ Carefully calibrate the tightening force to ensure that the panels are not deformed or damaged in the process !**



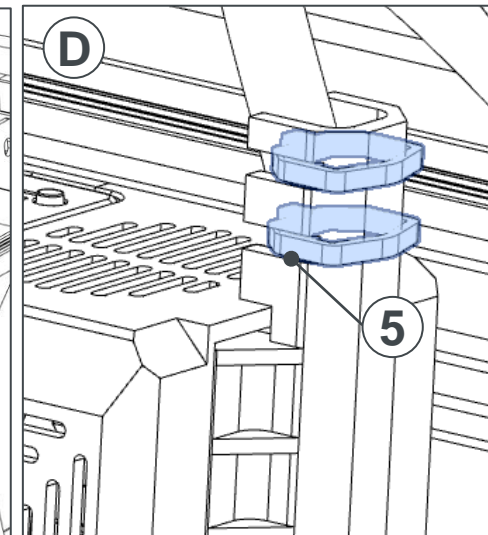
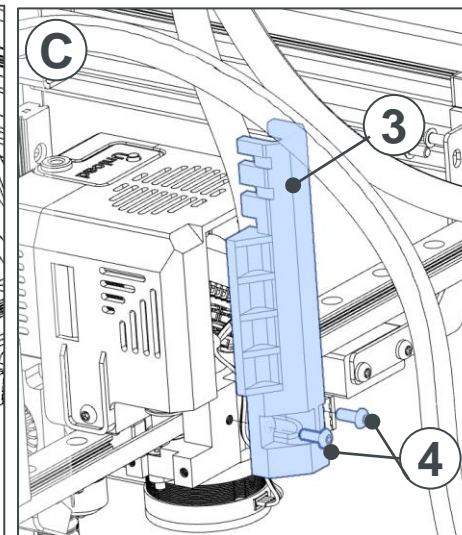
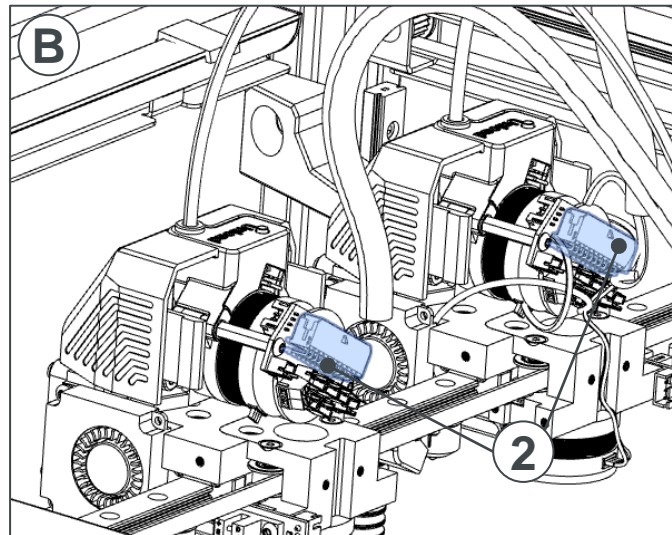
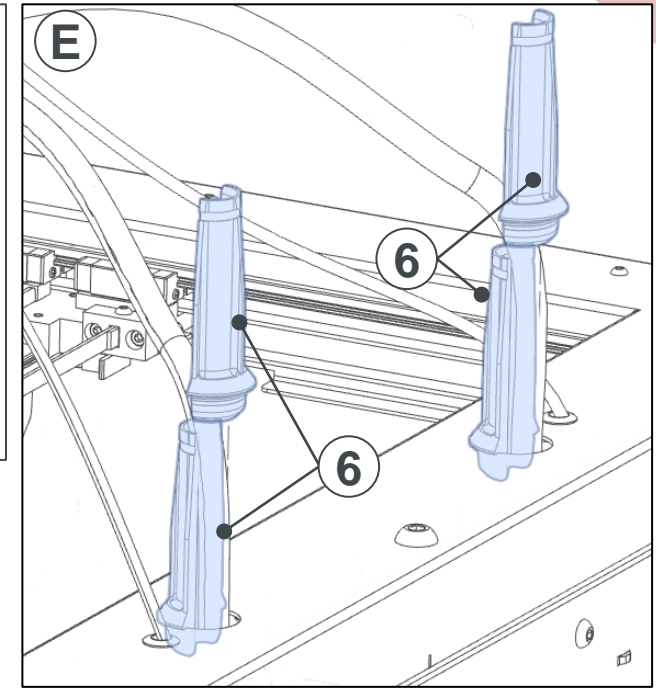
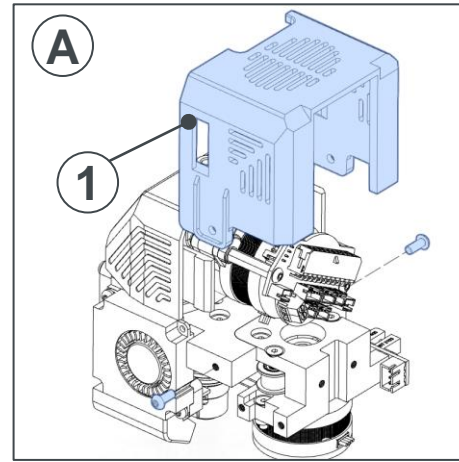
## 3.6 Cable management chamber

- Place the cable from the print head (T1) in an upward direction and thread it through the upper hole on the top frame as shown -- refer to image A and B
- Securely fasten the cable to the back panel using cable ties (1), as instructed -- refer to image A
- Repeat the same steps from above for print head (T0).
- Return your attention to the cable for the print head (T1).
- Guide the cable branch for the chamber fans through the hole in the back panel, then connect the connector (2) to the split board as shown -- refer to image A and C
- Guide the cable branch for Y-axis stepper motor through the opening in the metal plate, then connect the connector (6) to the stepper as shown -- refer to image D and E
- Connect the chamber temperature sensor (3) -- refer to image D
- Connect the Y-axis endstop (5) -- refer to image D
- Plug the LED connector (4) -- refer to image D
- Securely fasten the cable to the edge using cable ties (1) -- refer to image D
- Fasten the LED coupling to the metal bracket with a cable tie (1) as indicated -- refer to image D



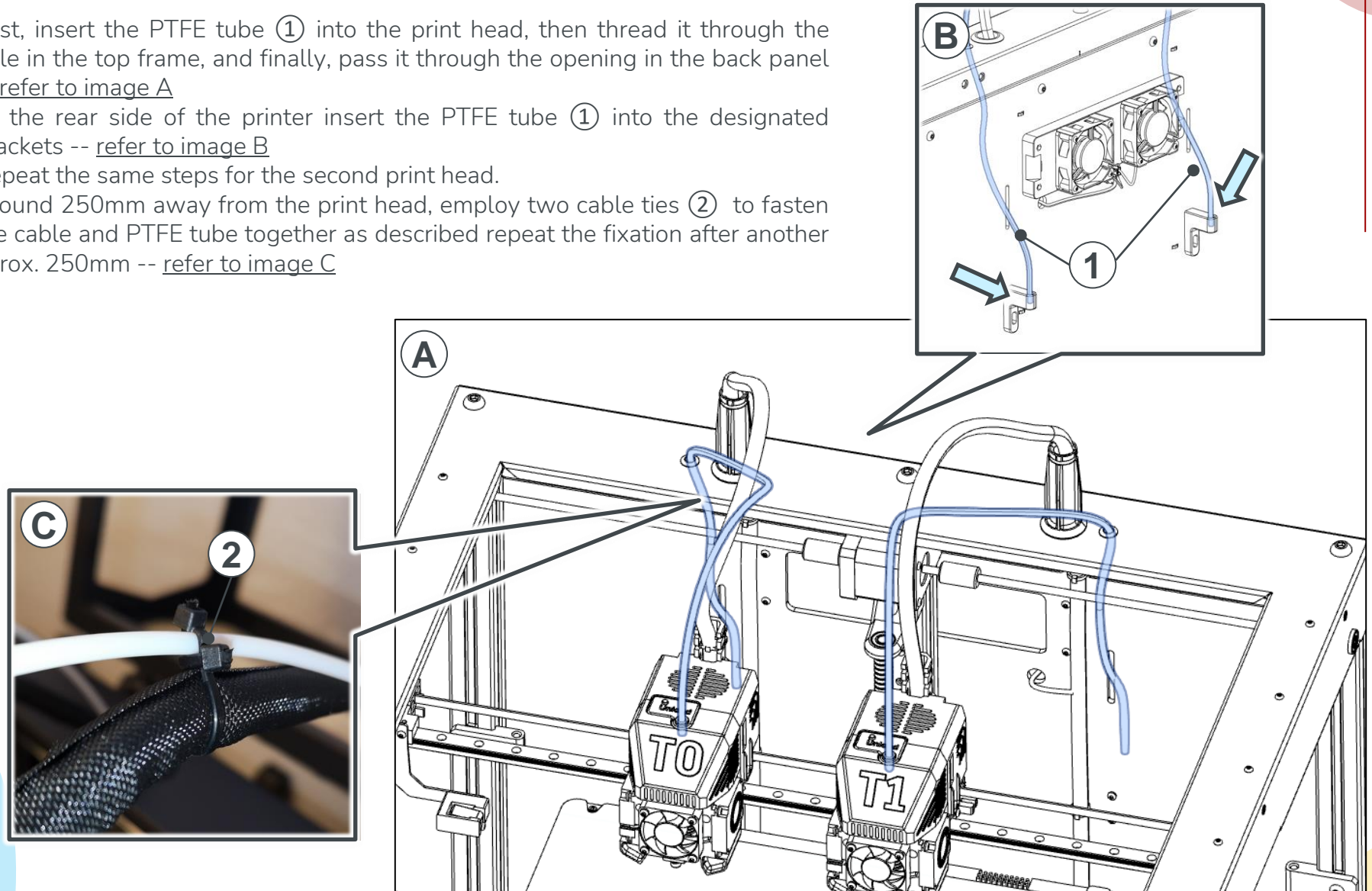
# 3.7 Cable management print heads

- Disassemble the printing heads covers ① -- refer to image A
- Plug the connectors ② that correspond to each print head. **It can be hard to push the connectors all the way in; use pliers if necessary!** -- refer to image B
- Assemble back the covers onto the printing heads.
- For each print head assemble the cable guide ③ on the end of the corrugated tube and then on the back side of the print head and secure it in place with M3x8 screws ④ -- refer to image C
- **Be certain to avoid pinching any wires during the installation process!**
- Secure the cable in place with cable ties ⑤ -- refer to image C
- Secure the corrugated tubes with clamps ⑥ as indicated. At the upper ends bind the two clamps together with a cable tie -- refer to image E



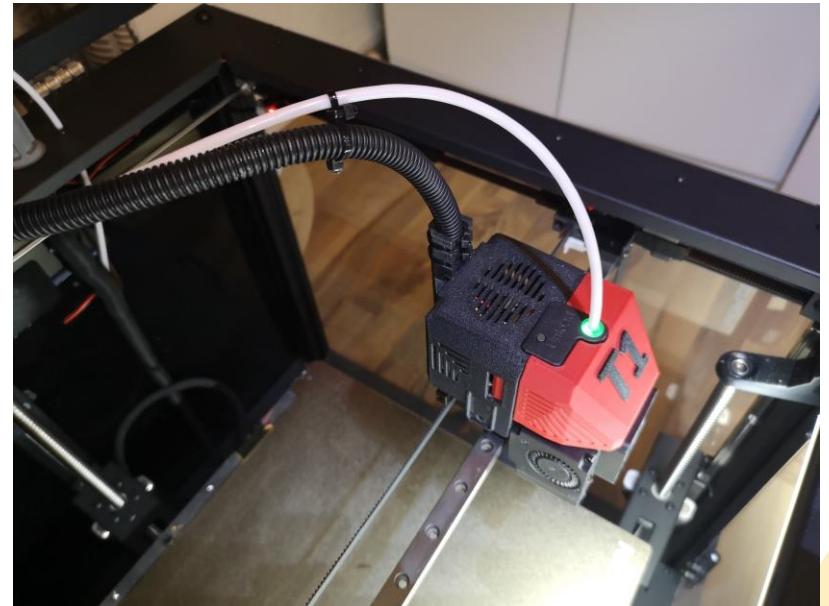
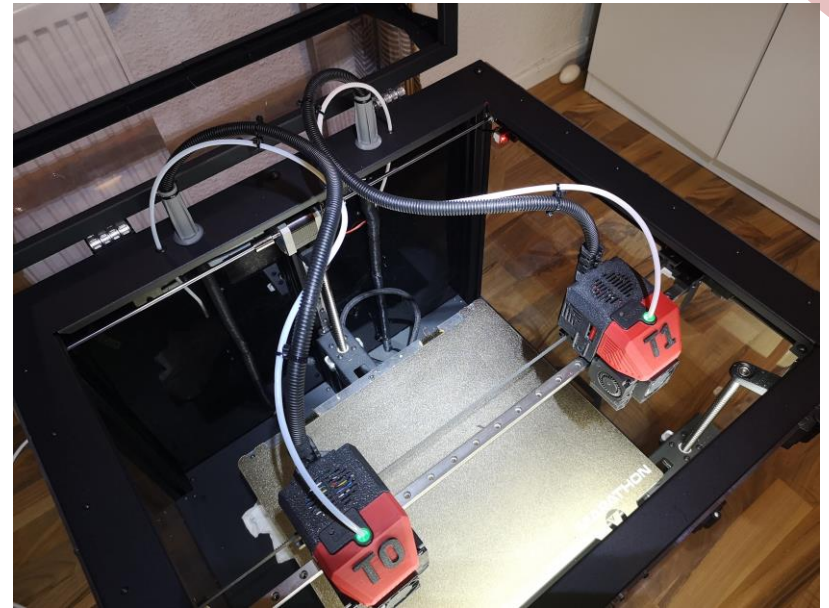
## 3.8 PTFE tubes

- First, insert the PTFE tube ① into the print head, then thread it through the hole in the top frame, and finally, pass it through the opening in the back panel -- refer to image A
- At the rear side of the printer insert the PTFE tube ① into the designated brackets -- refer to image B
- Repeat the same steps for the second print head.
- Around 250mm away from the print head, employ two cable ties ② to fasten the cable and PTFE tube together as described repeat the fixation after another approx. 250mm -- refer to image C



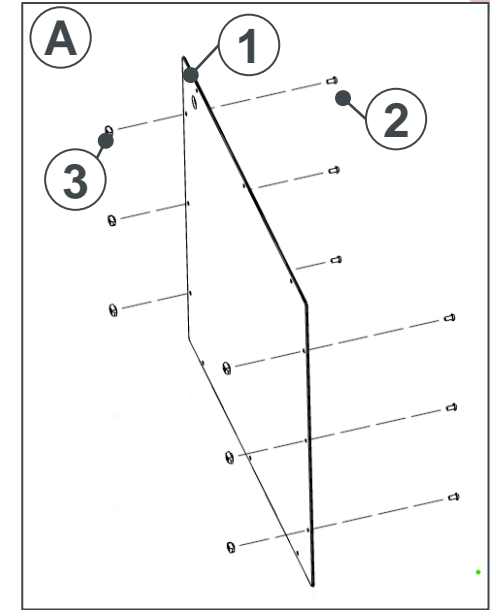
## 3.7/8 Cables & PTFE tubes management – Pictures from reality

- For a better understanding of how the cables to the print heads and PTFE tubes are supposed to look after assembly, please refer to the attached pictures.

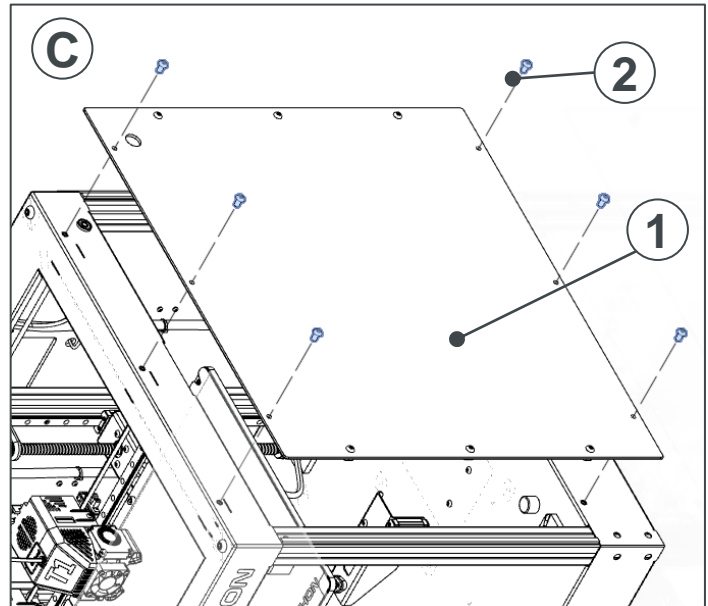
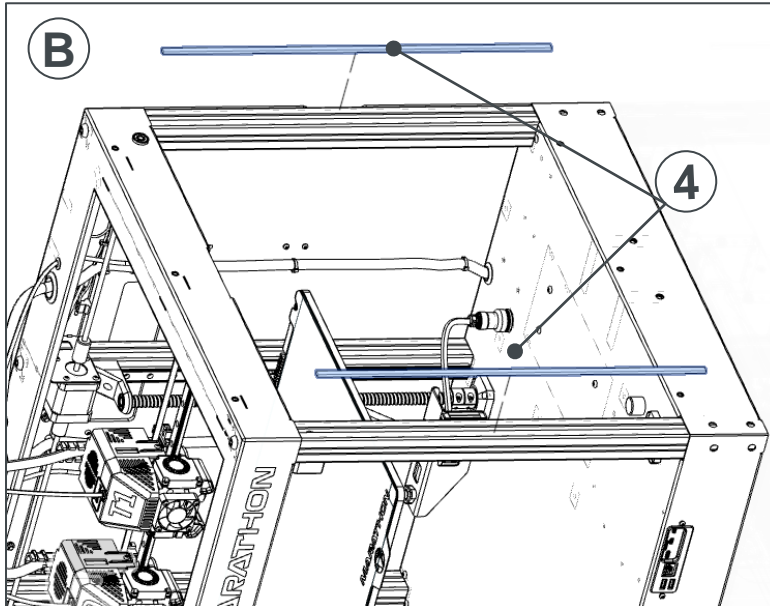


# 3.9 Side panel left

- The Plexi sheet for the side panels is identical for both the left and right sides of the printer. The only difference is that the screws are assembled from opposite sides.
- Lay the printer with its right side on a flat surface.
- Take the side panel ① and pre-assemble the M5x10 screws ② and T-Nuts ③ as indicated -- refer to image A
- Leave the T-Nuts loose for now !
- Add foam strips ④ on the aluminium profiles as shown -- refer to image B
- Place the side panel ① on the left side of the printer and ensure that all the T-Nuts have entered in the channels of the aluminium profiles.
- Use an Allen key to secure the side panel with M5x10 ② screws along both its upper and lower edges as indicated -- refer to image C
- Proceed to tighten all the remaining screws.

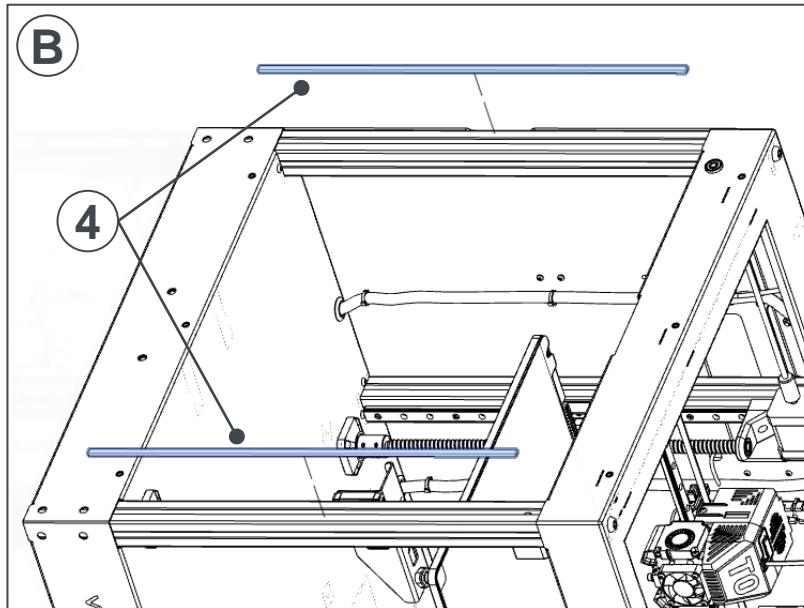
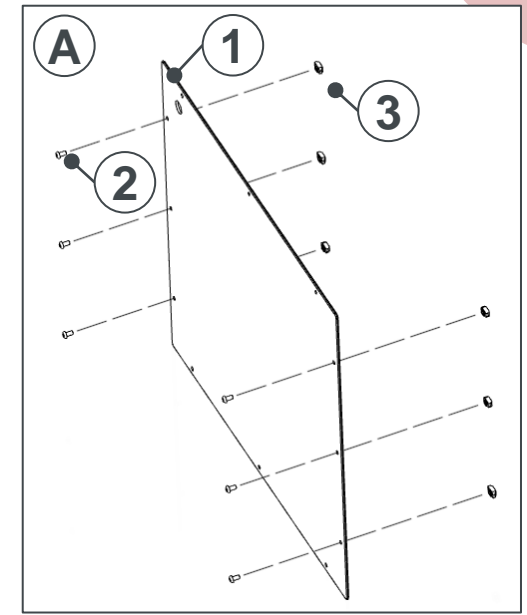


**!** Carefully calibrate the tightening force to ensure that the panels are not deformed or damaged in the process !

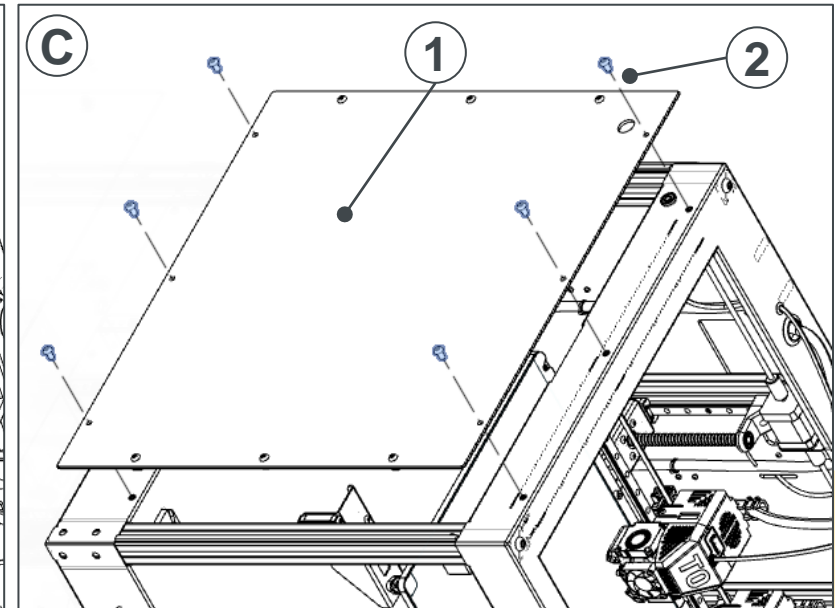


# 3.10 Side panel right

- The Plexi sheet for the side panels is identical for both the left and right sides of the printer. The only difference is that the screws are assembled from opposite sides.
- Lay the printer with its left side on a flat surface.
- Take the side panel ① and pre-assemble the M5x10 screws ② and T-Nuts ③ as indicated -- refer to image A
- Leave the T-Nuts loose for now !
- Add foam strips ④ on the aluminium profiles as shown -- refer to image B
- Place the side panel ① on the right side of the printer and ensure that all the T-Nuts have entered in the channels of the aluminium profiles.
- Use an Allen key to secure the side panel with M5x10 ② screws along both its upper and lower edges as indicated -- refer to image C
- Proceed to tighten all the remaining screws.



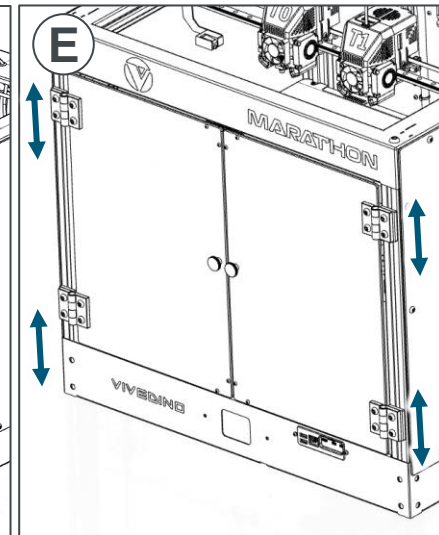
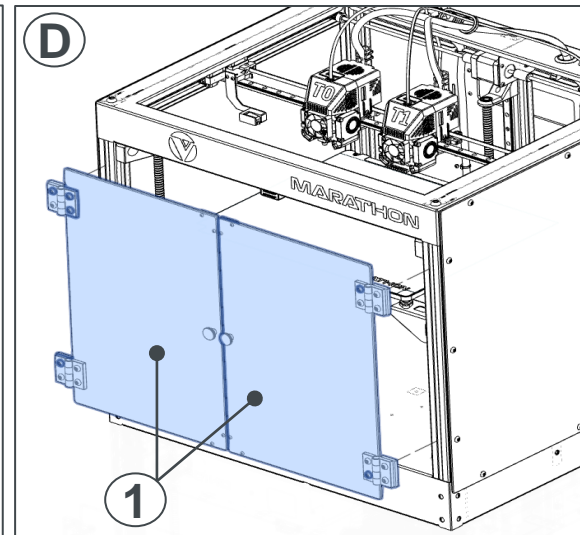
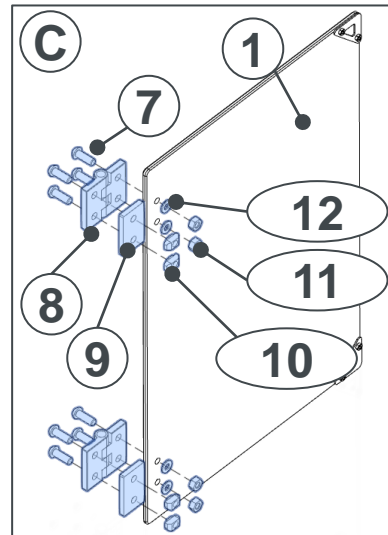
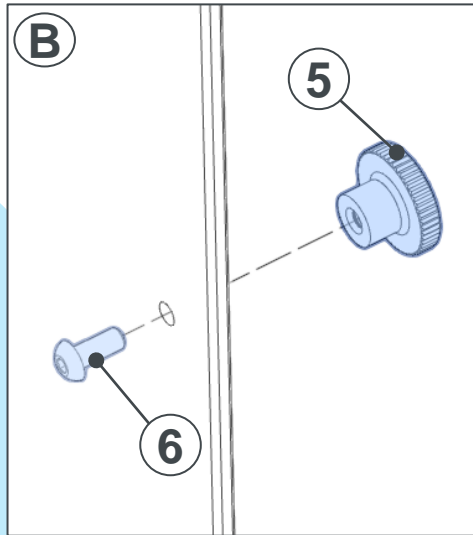
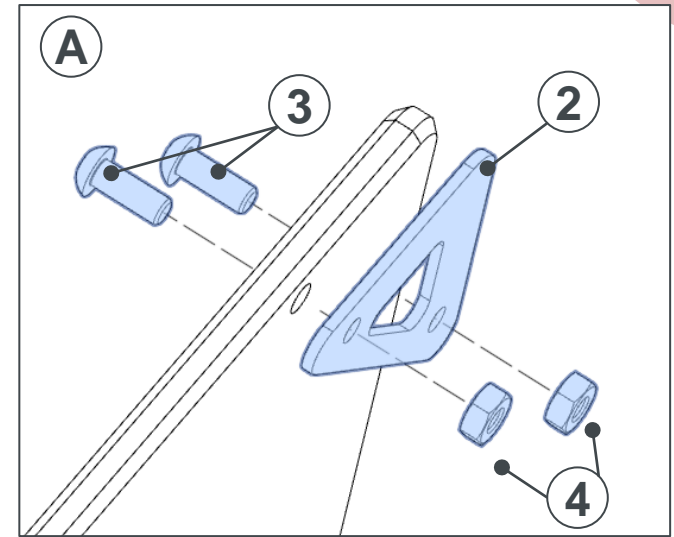
**!** Carefully calibrate the tightening force to ensure that the panels are not deformed or damaged in the process !





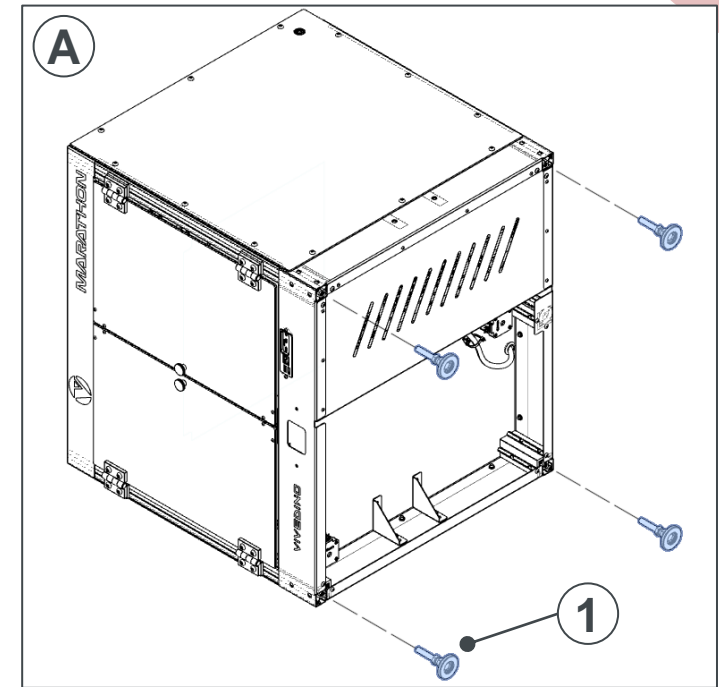
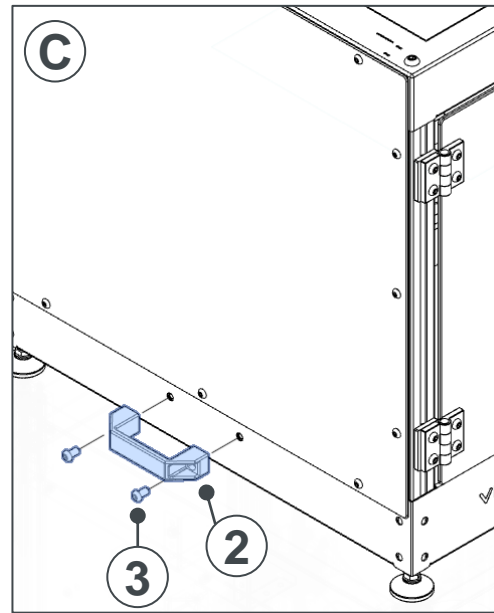
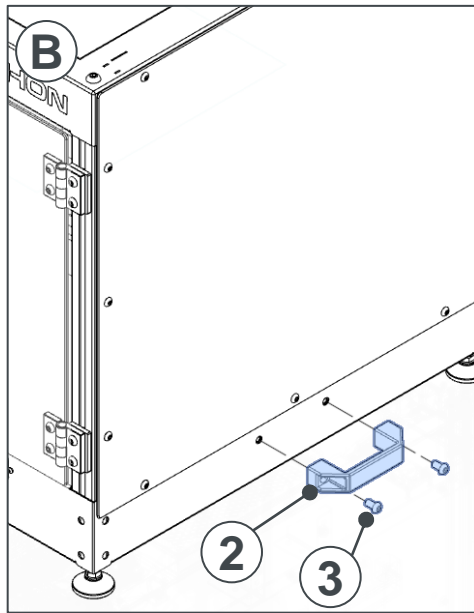
# 3.11 Front doors

- Both front doors ① are identical.
- On each door ① two metal corners ② have to be assembled. Use M3 screws ③ and M3 Nuts ④ as indicated -- refer to image A
- Each door has a knob ⑤. Install it with M4 screw ⑥ as shown -- refer to image B
- Using M6x18 screws ⑦, washers ⑫, and M6 hexagonal nuts ⑪, attach two hinges ⑧ onto each door ① -- refer to image C
- On the other half of the hinge ⑧, pre-assemble the offset part ⑨ and T-nuts ⑩ using M6x18 screws ⑦ -- refer to image C
- Leave the T-Nuts loose for now !
- Place the doors ① on front side of the printer and ensure that all the T-Nuts ⑩ have entered in the channels of the aluminium profiles -- refer to image D
- Use an Allen key to tighten the M6x18 screws ⑦ -- refer to image E
- If required, loosen the hinges ⑧ screws ⑦ on the aluminium profile side and adjust the position of the doors ① to ensure smooth and proper opening and closing -- refer to image E



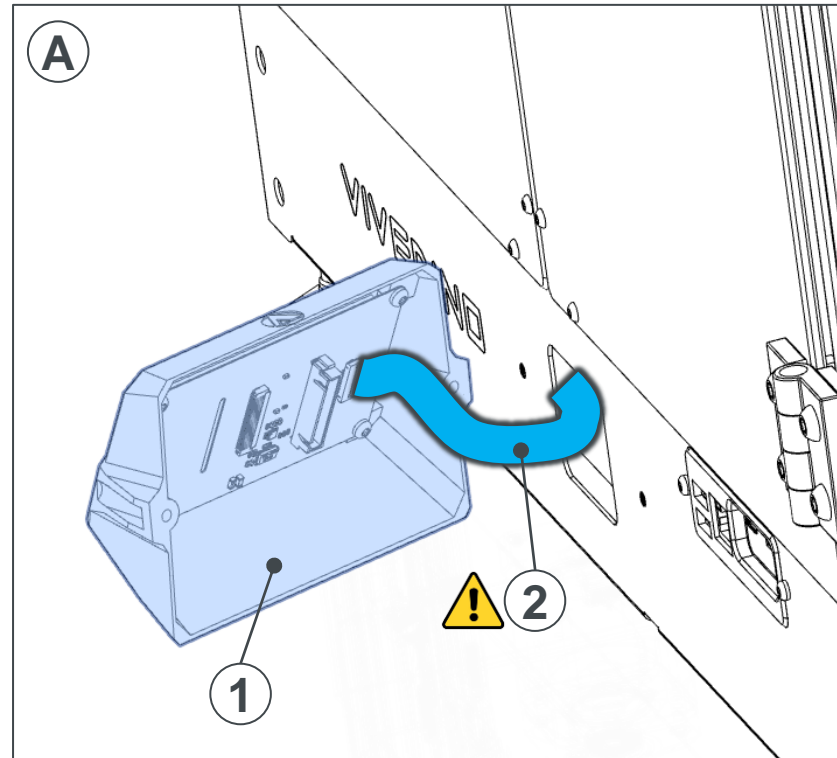
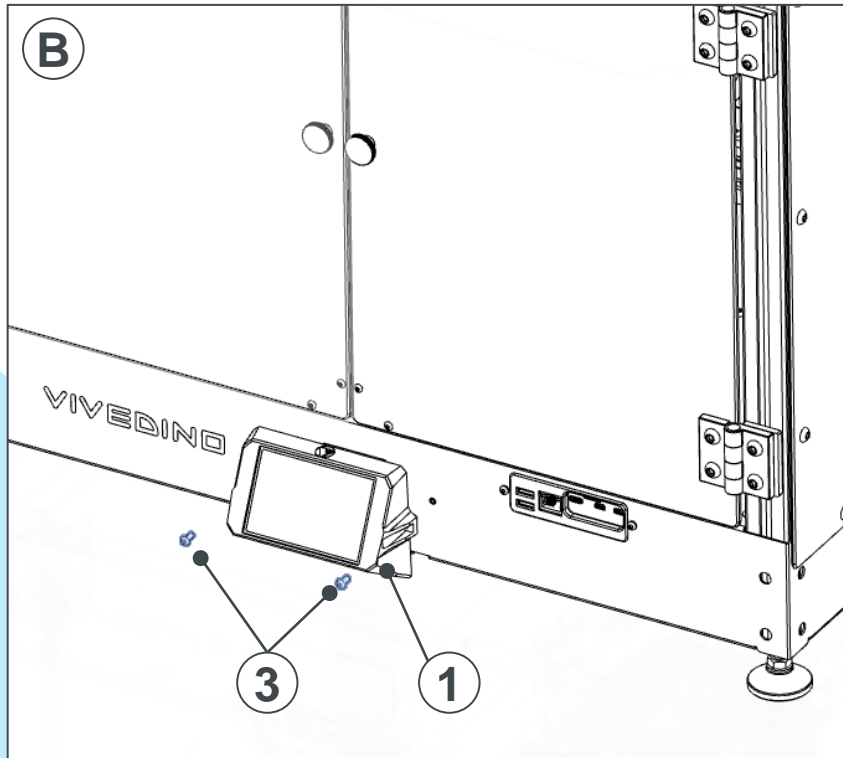
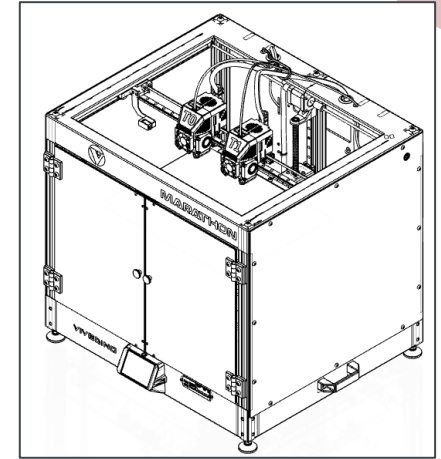
# 3.12 Feet and handles

- Lay the printer on one side.
- Secure the feet ① in place as shown using a wrench -- refer to image A
- Place the printer back in a vertical position.
- Using an Allen key, install the handles ② on both sides of the printer and secure them in place with M6x12 screws ③ -- refer to image B and C



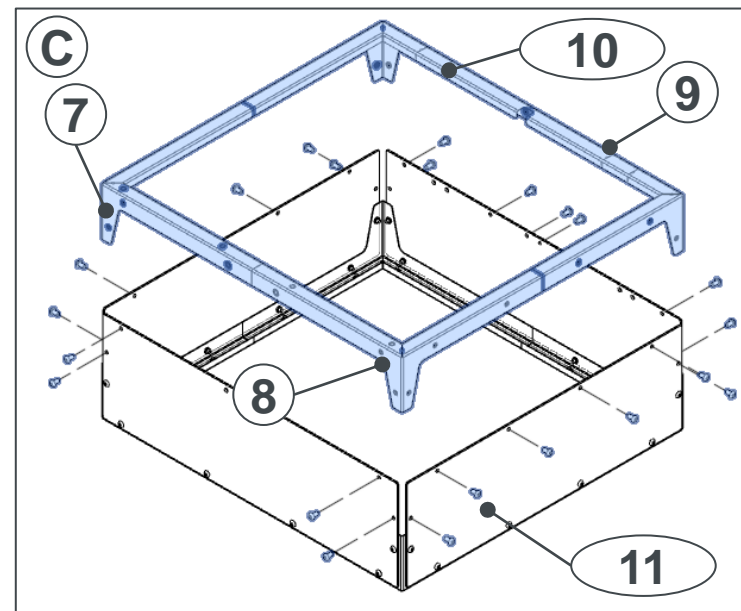
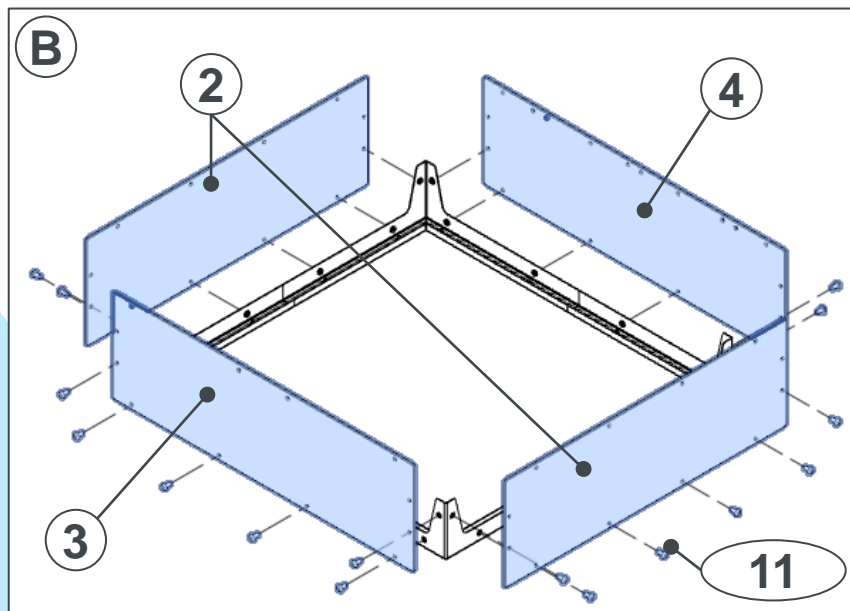
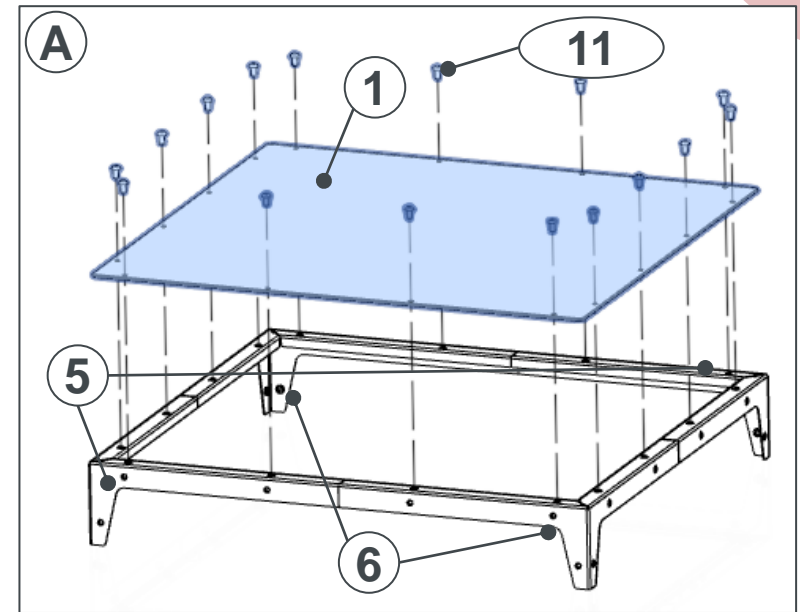
# 3.13 TFT display

- Carefully attach the ribbon cable ② to the connector on the rear side of the TFT display ①. The contacts of the ribbon cable must face the circuit board -- refer to image A
- Using an Allen key, install the TFT display ① in place with M3x8 screws ③ -- refer to image B



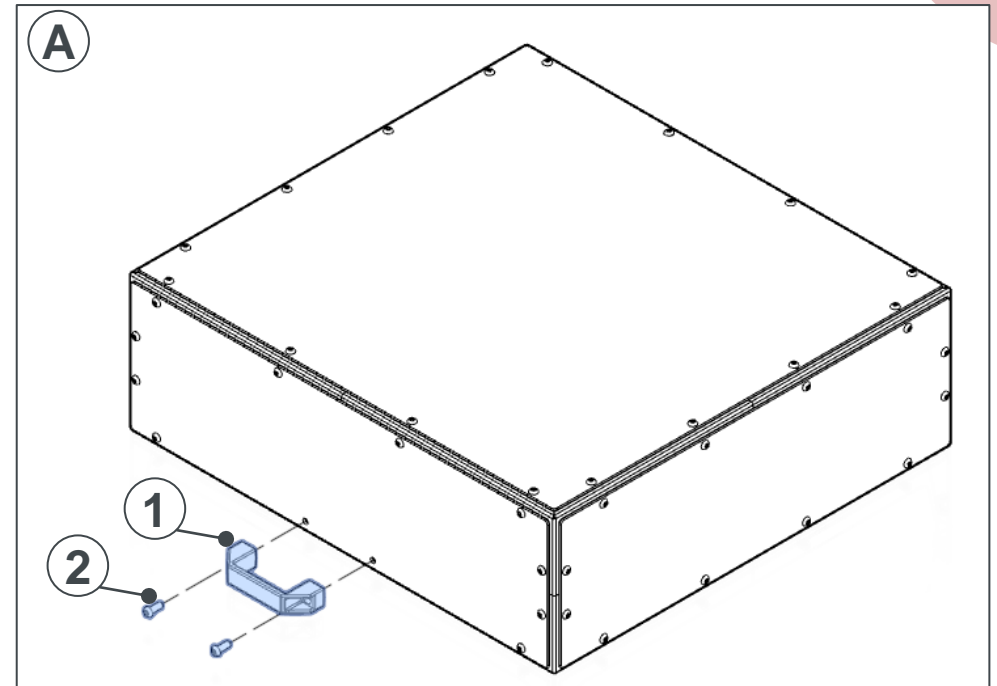
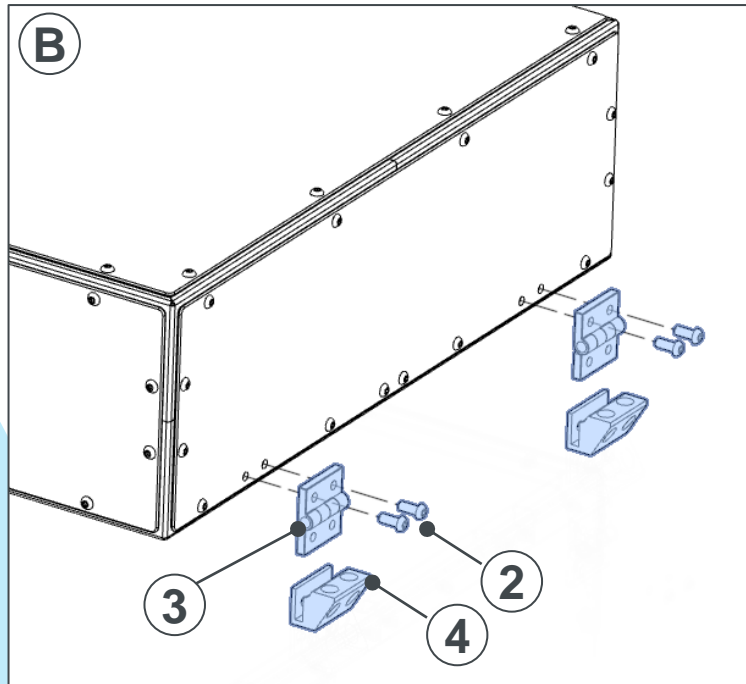
# 3.14 Top hut assembly

- Assembling the top hut is a relatively simple process. The key is to ensure careful attention is paid to the hole patterns on different parts so that they match together seamlessly.
- Fixate the panel ① using M5x10 screws ⑪ onto the corners ⑤ and ⑥ -- refer to image A
- Turn the assembly upside down
- Use M5x10 screws ⑪ to fixate the side panels ② and panels from front ③ and back side ④ as shown -- refer to image B
- Use M5x10 screws ⑪ to assemble the metal corners for the front side (⑦ and ⑧) and the ones from the back side (⑨ and ⑩) -- refer to image B



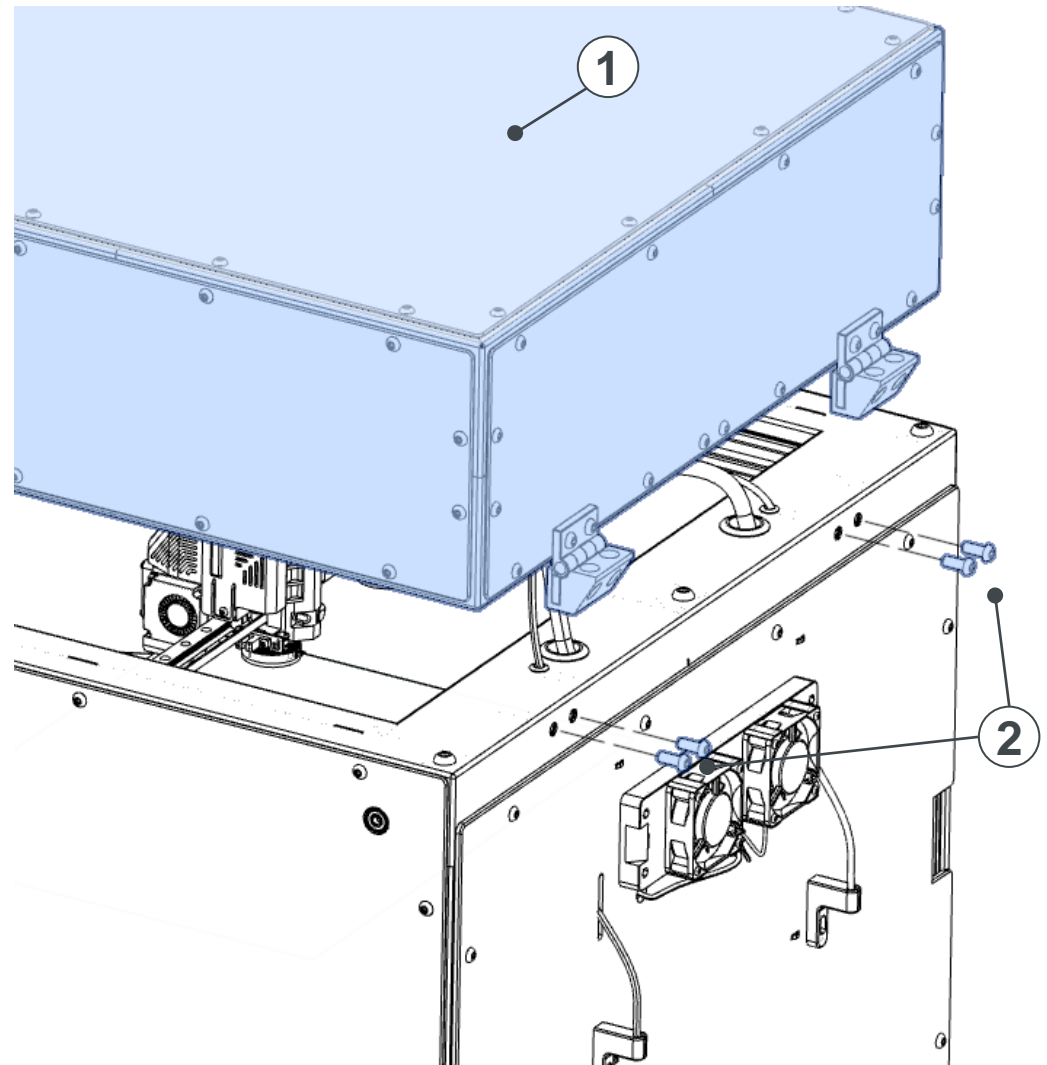
# 3.14 Top hut assembly

- Attach the handle ① to the front side using M6x16 screws ② -- refer to image A
- On the back side, install the two hinges ③ using M6x16 screws ② as instructed -- refer to image B
- Pre-install the bumpers ④ on each hinge ③ -- refer to image B



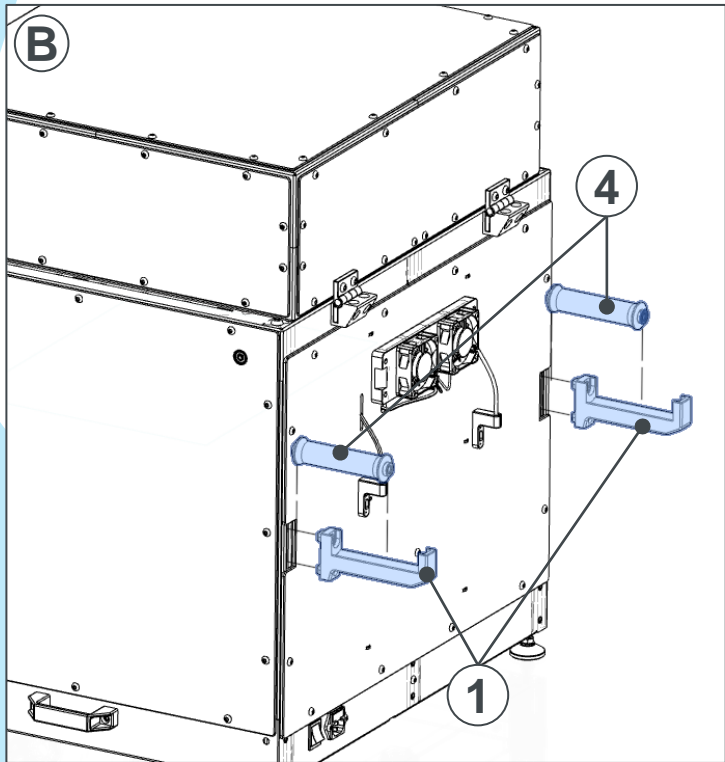
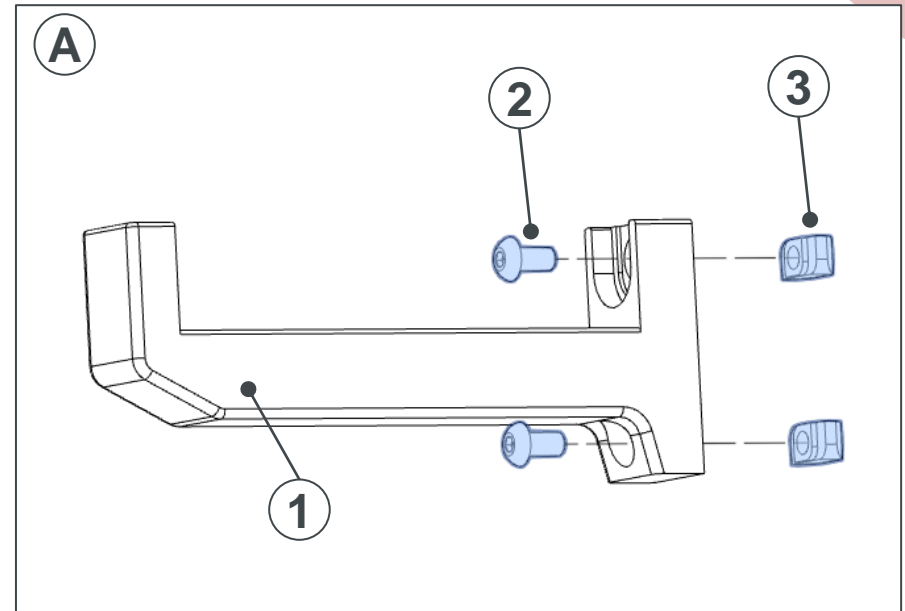
## 3.15 Top hut installation

- Place the top hut ① onto the upper side of the printer.
- Secure it in place with M6x16 screws ② as shown



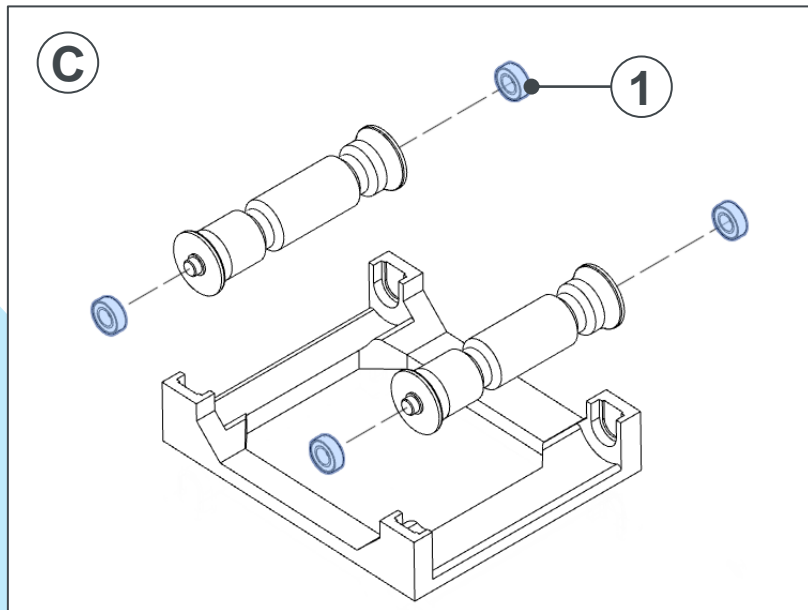
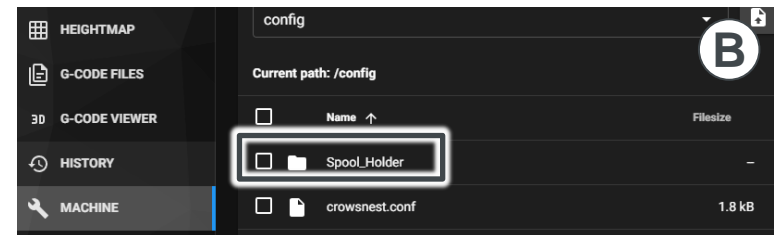
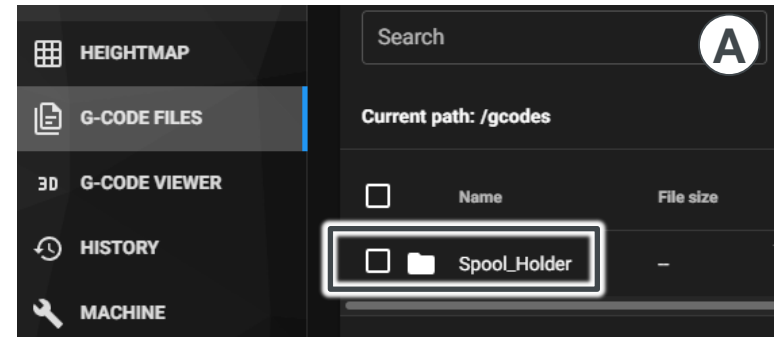
# 3.16 Spool holders

- Take the spool holders ① and pre-assemble the M5x10 screws ② and T-Nuts ③ as indicated -- refer to image A
- Using an Allen key, securely fasten the spool holders ① in the designated locations on the back side of the printer, as indicated -- refer to image B
- Insert the rolls ④ into the spool holders as shown -- refer to image B



# 3.16 Spool holders

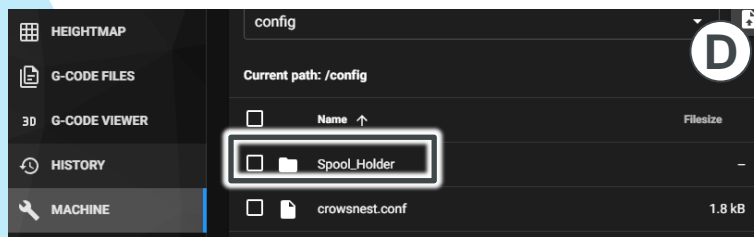
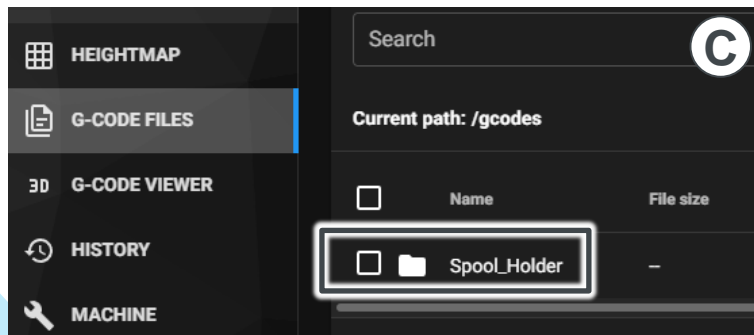
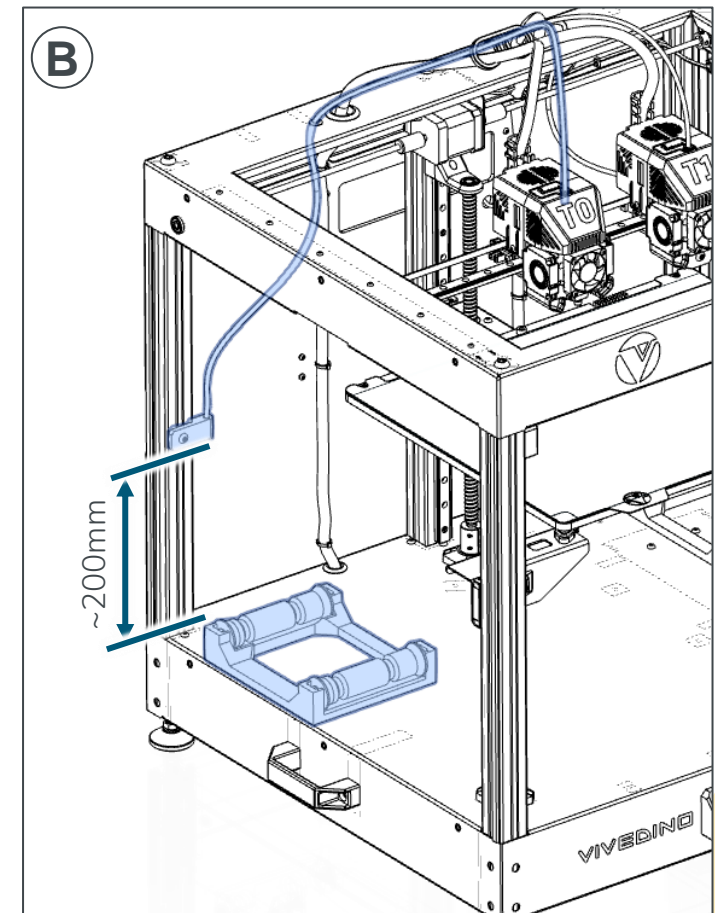
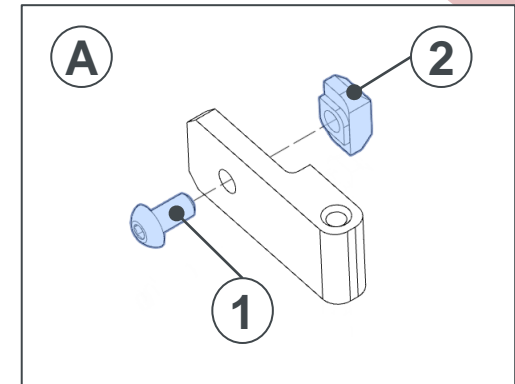
- Having the spools at the back of the printer might not suit everyone.
- If you intend to place the filament spools independently of the printer or inside the printer, the STL file (in 'MASCHINE' Menu from Mainsail) and print files (in 'G-Code Files Menu from Mainsail) for an independent spool holder are provided -- refer to image A and B
- The rolls ④ from page 22 are compatible with this spool holder design.
- Four additional bearings ① are included in the Marathon package for the construction of a second spool holder.
- The assembly of the spool holder is very simple -- refer to image C





# 3.17 Spool holders inside the printer

- Spools weighing 1 kg or less can also be placed inside the printer using the spool holder presented in the previous chapter.
- To achieve this, it will be necessary to print two PTFE-Tube brackets like the one presented in image A.
- Preassemble the M5x10 screw and M5 T-nut like described -- refer to image A
- Install the PTFE-Tube brackets as described -- refer to image B
- Thread the PTFE-Tubes like described -- refer to image B
- The STL file (in 'MACHINE' Menu from Mainsail) and print files (in 'G-Code Files Menu from Mainsail) are provided -- refer to image C and D



# 4.1 Foreword

## **Congratulations on successfully assembling the Marathon 3D printer!**

Your dedication and attention to detail have paid off, and you're now ready to embark on a journey of creativity and innovation.

Before you dive into printing, remember that calibrating the printer is the next crucial step.

This process will be thoroughly explained in the upcoming chapter.

Proper calibration ensures that your printer operates at its best and produces accurate, high-quality prints.

With your new 3D printer, the possibilities are endless, and we can't wait to see the amazing creations you'll bring to life.

Remember, every print is a step towards mastering this technology. Happy printing and enjoy the exciting world of 3D fabrication!



# 4.2 WIFI connection using SSH-Connection

- This method is based on using an SSH connection and follows these steps:
  - Connect the printer to your router using a LAN cable.
  - On the router's web page, discover the IP address of the printer.
  - Open Command Prompt in Windows
  - Type: `ssh biqu@<printer ip>` (ex: `ssh biqu@192.168.178.45`) -- refer to image A
  - A message will pop up asking for a yes/no or some fingerprint. Choose "yes."
  - You'll be asked about a password. The password is: `biqu` -- refer to image A
  - Now you are connected to the CB1 unit inside the printer, which is running Linux.
  - Type: `cd /boot` -- refer to image B
  - Type: `sudo nano system.cfg` -- refer to image B
  - Un-comment the rows and write your Wifi credentials in the indicated fields. -- refer to image C
  - (OPTIONAL). You can uncomment the row and input your time zone in this file, allowing you to skip chapter 4.13. -- refer to image D
  - Hit: `Ctrl+X`
  - Hit: `Ctrl+y`
  - Hit: `Enter`
  - Close Command Prompt
  - Switch OFF the printer and start it again
  - The printer will connect to your Wifi now
  - By typing in your internet browser: `http://<printer ip>` you will land on the Mainsail Interface. (ex: `http://192.168.178.45`)

**A**

```
C:\Users\marin>ssh biqu@192.168.178.27
The authenticity of host '192.168.178.27 (192.168.178.27)' can't be established.
ECDSA key fingerprint is SHA256:hr5m4gZrymw4T+Ig3A/PuI8qhZluSEiIpLCAPyggksk.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes_
Warning: Permanently added '192.168.178.27' (ECDSA) to the list of known hosts.
biqu@192.168.178.27's password:
```

**B**

```
Welcome to BTT-CB1 2.3.2 Bullseye with Linux 5.16.17-sun50iw9

System load:  24%          Up time:      59 min
Memory usage: 22% of 986M  IP:          192.168.178.27
CPU temp:    43°C         Usage of /:   91% of 4.4G

Last login: Sun Feb 11 12:20:16 2024 from 192.168.178.28
biqu@Marathon:~$ cd /boot
biqu@Marathon:/boot$ sudo nano system.cfg
```

**C**

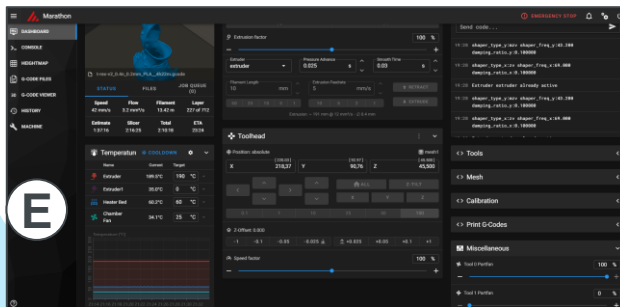
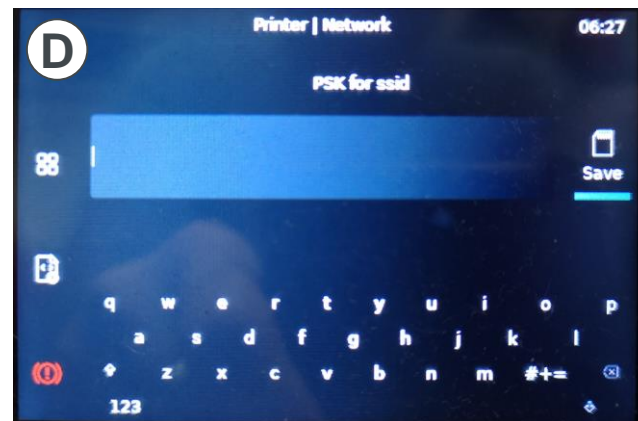
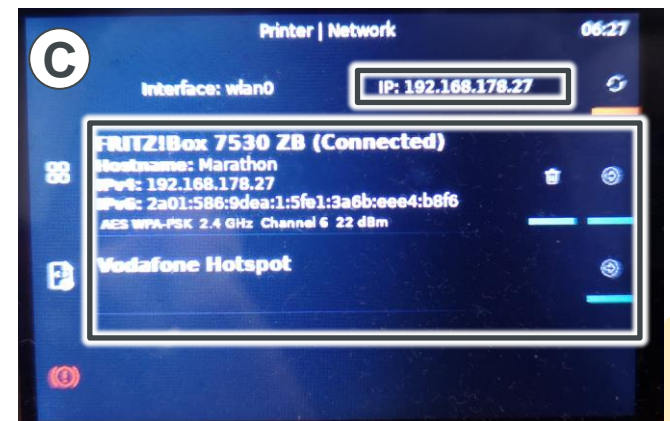
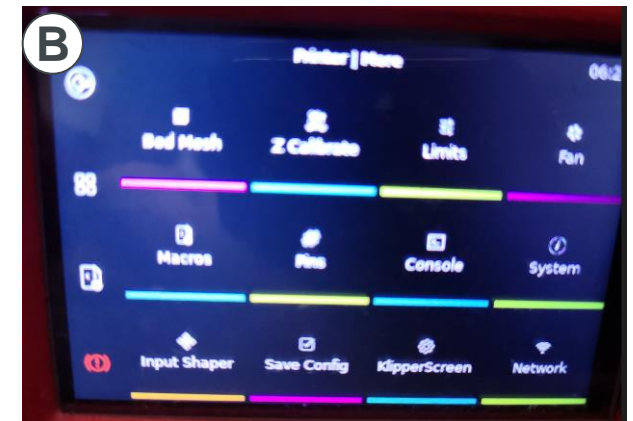
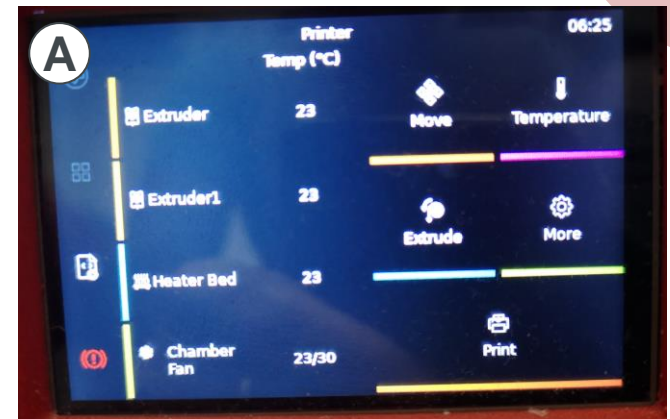
```
#####
# wifi name
WIFI_SSID="Your WiFi" ←
# wifi password
WIFI_PASSWD="Wifi password" ←
#####
```

**D**

```
#####
# System time zone setting, default Beijing time (East 8)
# More settable time zones can be viewed by running the command: timedatectl list-timezones
#TimeZone="Asia/Shanghai"
#####
```

# 4.3 WIFI connection using the controller display

- After first starting the printer, the first thing you should consider to connect it to your WIFI.
- On the printer TFT screen click on 'More' icon from Klipper Screen Main Menu -- refer to image A
- Then click on 'Network' and from the listed WIFI networks detected, choose the one you want the printer to connect to -- refer to image B and C
- Type the network password -- refer to image D
- Type the IP-Address of your printer in your internet browser -- refer to image C
- If you prefer to use an Ethernet cable instead of WIFI, simply connect the printer to your router with a LAN cable, and you'll be all set.



# 4.4 Home, Z-Tilt and probe offset

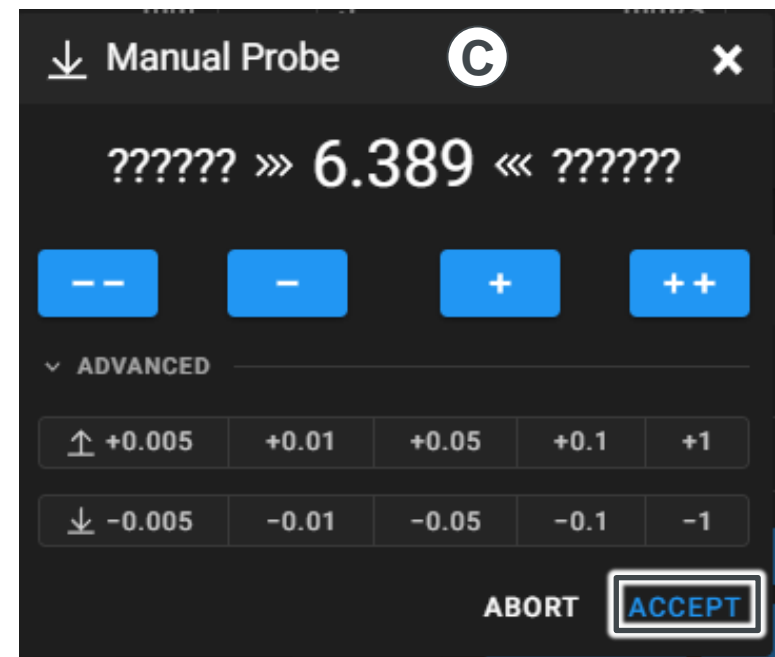
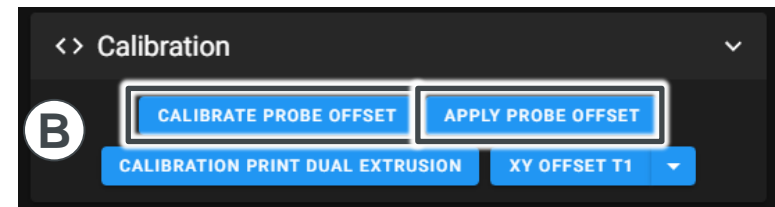
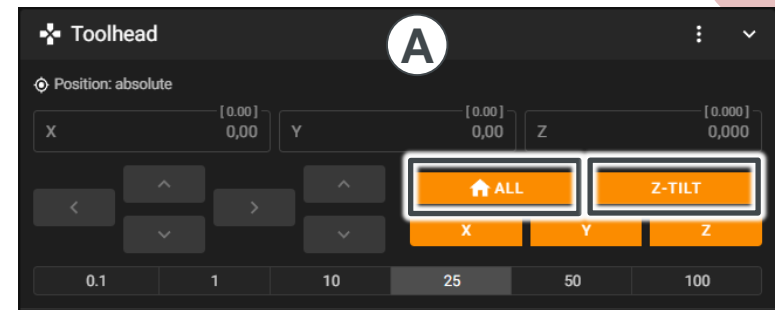
- Assuming you have successfully connected the printer to your router, you can now proceed with the calibration process.
- Go to the Mainsail interface (<http://marathon.local>) on 'Dashboard'
- Home your printer by clicking on 'Home All' -- refer to image A
- Align the three Z-axis stepper motors by clicking 'Z-Tilt'-- refer to image A
- The default factory value for the probe offset is only approximate. To ensure precision, you must calibrate it specifically for your printer by following the steps outlined below.
- Move T0 print head somewhere to the middle of the bed
- Go to 'Calibration' menu and click 'CALIBRATE PROBE OFFSET' -- refer to image B
- The probe calibration menu will open -- refer to image B
- Prepare a sheet of paper and place it between the nozzle and the bed surface. This paper will serve as your guide throughout the calibration process. When you feel slight resistance while sliding the paper between the nozzle and the printing surface, it indicates that you have found the precise probe offset for your printer.
- Click 'ACCEPT' in the calibration menu -- refer to image C
- Click 'APPLY PROBE OFFSET' in order to save in the configuration file the value determined for probe offset '-- refer to image B

The build plate of the Marathon is not the same on both sides. One side is textured, and on the other side, a shiny PEI foil is applied. The probe offset is different for each side.

**FOR THE SHINY SURFACE -0,200 mm HAVE TO BE APPLIED COMPARED WITH THE TEXTURED SIDE.**

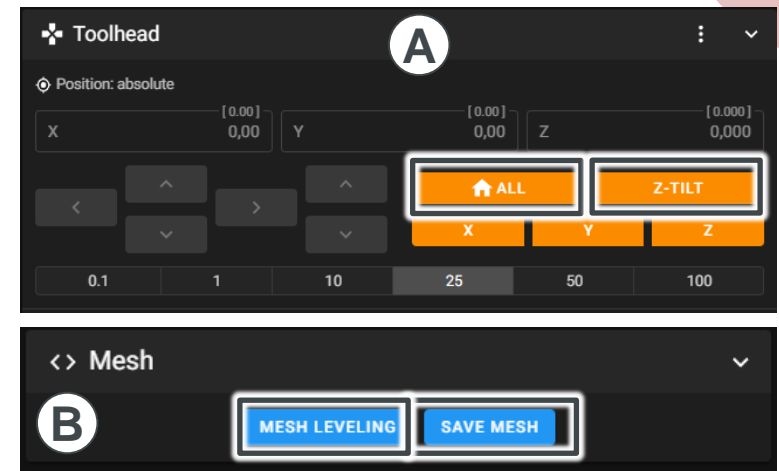


(For example, if the offset for the textured surface was determined to be 1,200 mm, then for the shiny surface, it will be 1,000 mm.)



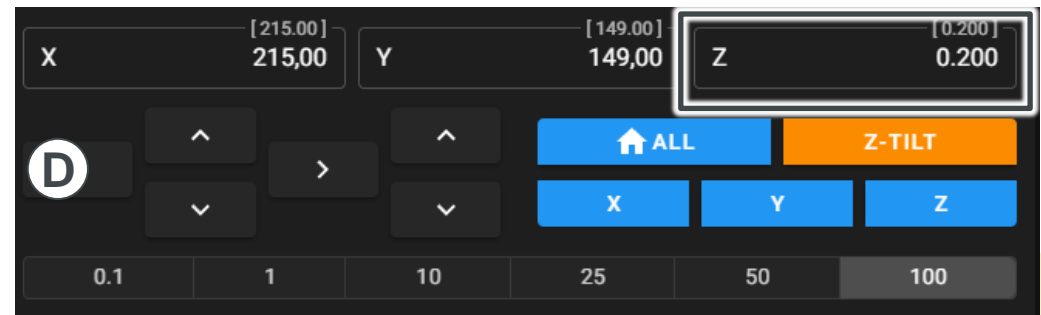
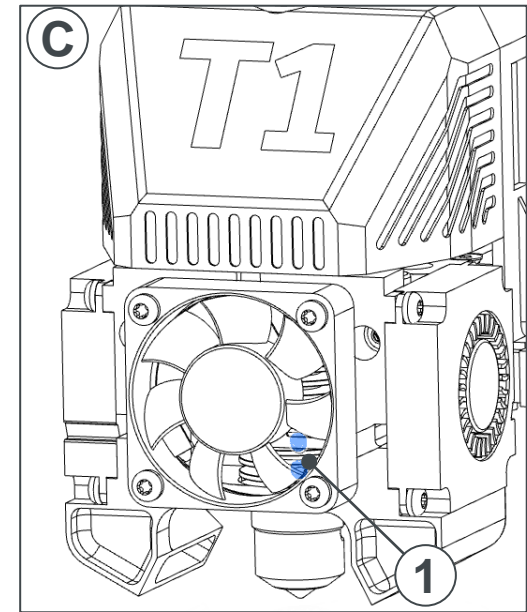
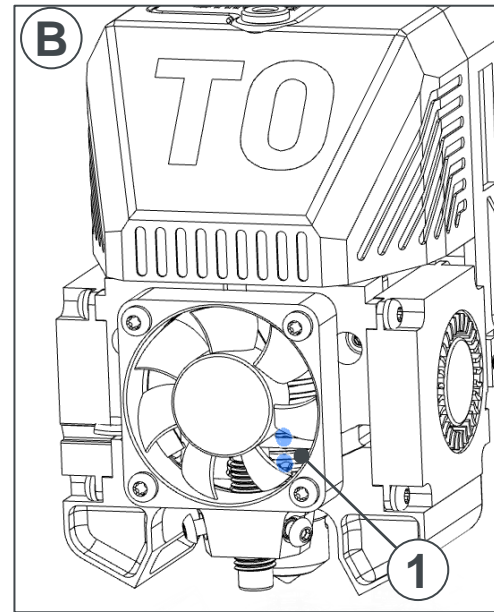
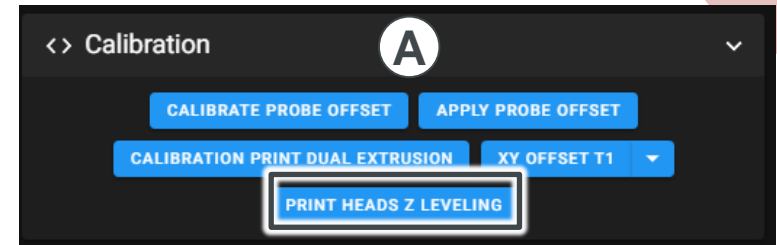
# 4.5 Mesh leveling

- Go to 'Mesh' menu and click 'MESH LEVELING' -- refer to image B
- The printer will first heat up the bed, then perform Z-Tilt, and finally, initiate bed probing.
- After the bed probing is done click 'SAVE MESH' -- refer to image B
- The last saved mesh will be always used when printing something
- If you change the print surface or you observe that the first layer is not consistent anymore, redo the steps described above in order to update your bed mesh



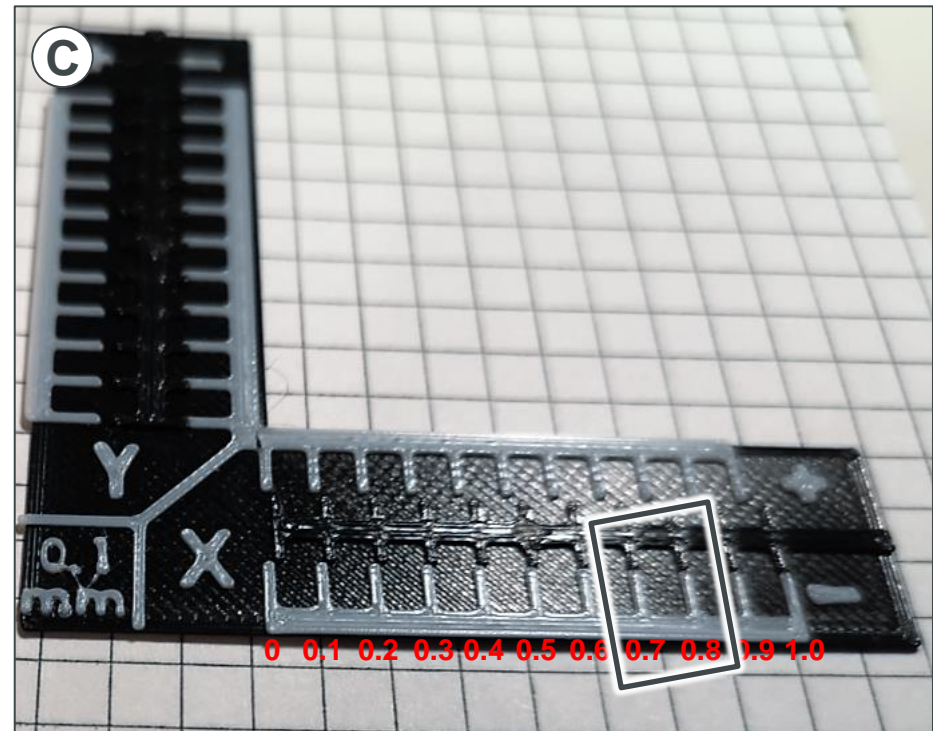
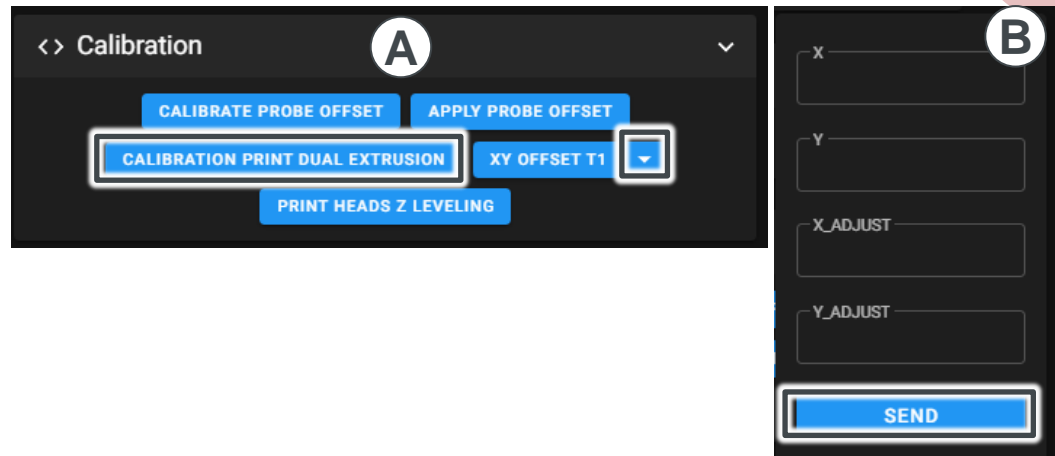
# 4.6 Print heads Z-leveling

- Ensuring that the nozzles from the two printing heads are at the same height is crucial to successfully achieve dual printing jobs or printing in 'Copy' and 'Mirror' mode.
- In the Marathon 3D printer, Z-leveling is achieved through a hardware-based method.
- In the Mainsail interface (<http://marathon.local>) on 'Dashboard' go to 'Calibration' menu and click 'PRINT HEADS Z LEVELING' -- refer to image A
- The printer will home the axes, clean the nozzles, perform Z-tilt calibration, and then position both print heads at the center of the bed.
- For the next steps, the hotends must be cooled down, and the hotend fans MUST be turned OFF.
- Insert a suitable hex key through the blades of the front fan and loosen the screws ① that hold the hotend -- refer to image B and C
- Move the Bed to **Z0.2** -- refer to image D
- Push the hotends down to ensure that the nozzles from both print heads come into contact with the print surface.
- Tighten the hotend screws ① using the hex key for both T0 and T1 -- refer to image B and C
- As long as you do not change the nozzle or the hotend, you will never need to repeat this step again.
- A recalibration of probe offset is recommended.



# 4.7 Print heads XY-offset calibration

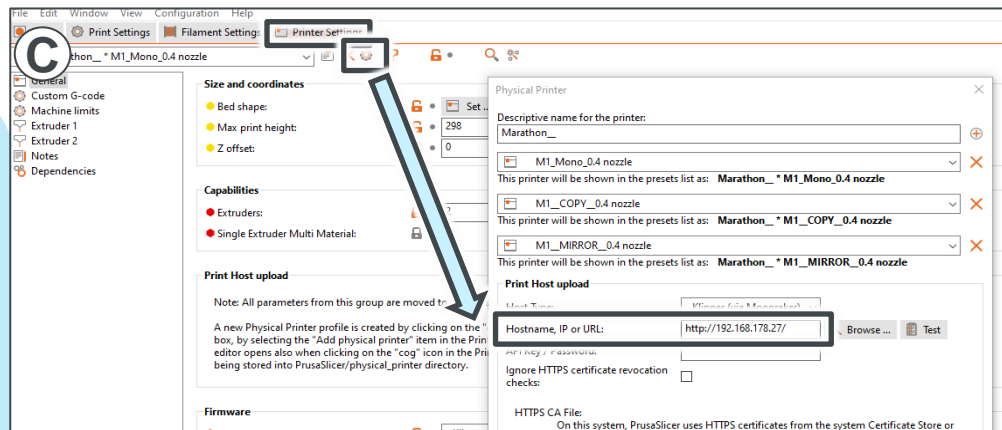
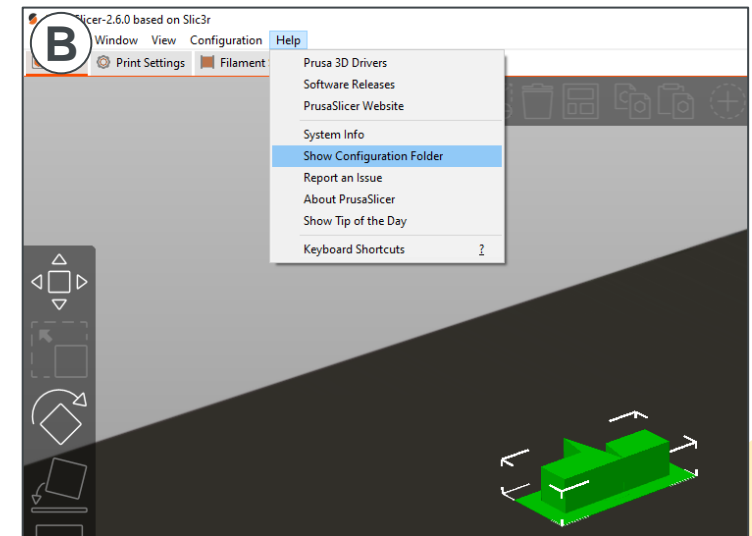
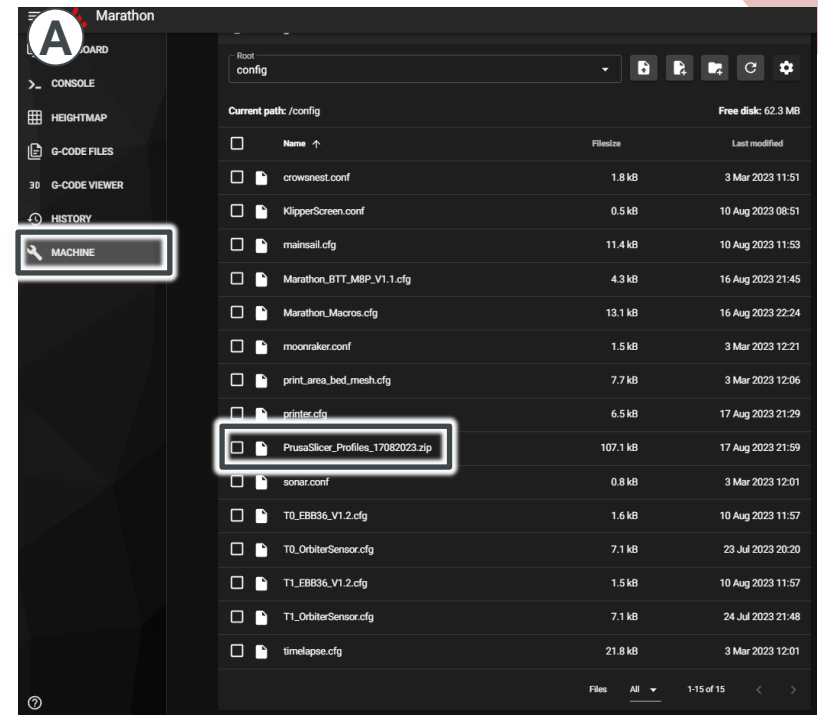
- To achieve flawless dual-material prints, it is essential to ensure that the offsets between the two printheads are properly compensated.
- In the Marathon 3D printer, XY-offset calibration is achieved by performing a calibration print.
- Ensure that you have filament loaded into each extruder, preferably using highly contrasting colours such as black and white filament.
- In the Mainsail interface (<http://marathon.local>) on 'Dashboard' go to 'Calibration' menu and click 'CALIBRATION PRINT DUAL EXTRUSION' -- refer to image A
- The printer will initiate a dual-color model print that is estimated to take approximately 10 minutes. The printing temperatures are set for PLA (205°C hotends and 60 °C the bed)
- Examine the model closely and identify the aligned markings. The offset specified by these markings is 0.1mm, with the first one corresponding to 0.
- In 'Calibration' menu, click on the arrow from 'XY OFFSET T1' -- refer to image A
- A new window will appear, allowing you to input the readings from the calibration model for both 'X' and 'Y' axes. Once entered, proceed by clicking 'Send' -- refer to image B
- In the example provided by image C the markings for the X-axis at -0.7 and -0.8 are perfectly aligned. Therefore, for this specific case, the input will be -0.75 for the X-axis in the offset window.
- To verify and potentially fine-tune the calibration, reprint the calibration model and carefully inspect it. If adjustments are necessary, input the corresponding values into the X\_ADJUST and Y\_ADJUST fields. -- refer to image B
- As long as you do not change the nozzle or the hotend, you will never need to repeat this step again.





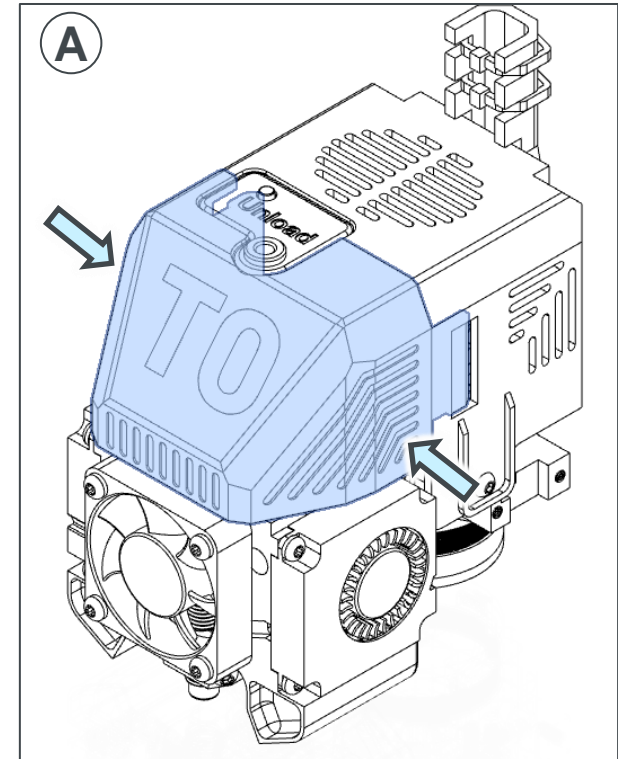
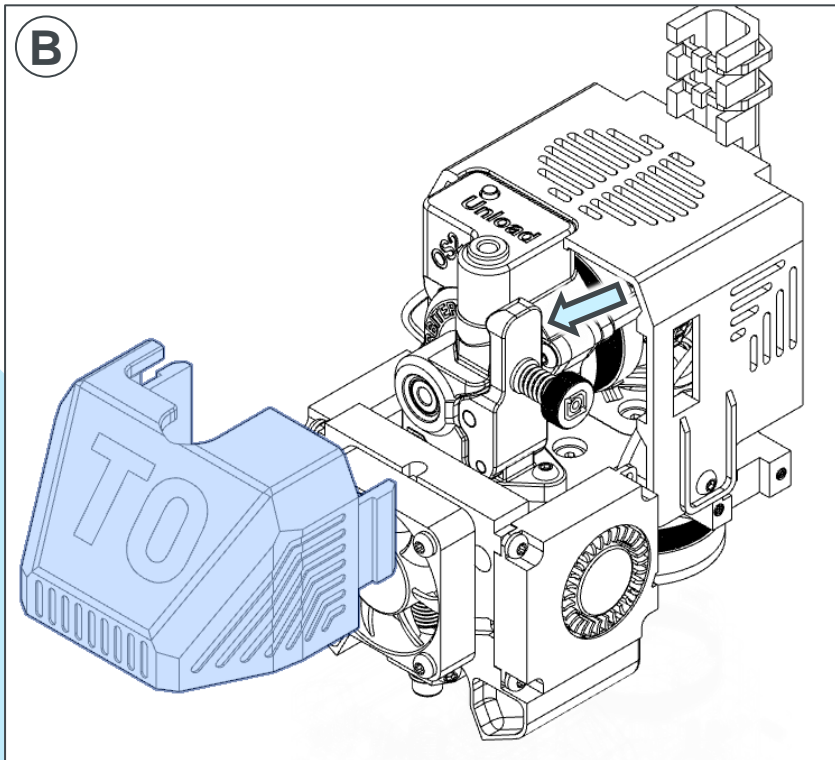
# 4.8 Slicer Profiles

- The calibration process for the printer has been successfully completed by following the instructions outlined in the previous sections. The printer is now prepared for printing.
- To generate G-code files, you will need slicing software along with specific slicing profiles designed for the Marathon 3D printer.
- Download 'PrusaSlicer' from here: [https://www.prusa3d.com/page/prusaslicer\\_424/](https://www.prusa3d.com/page/prusaslicer_424/)
- Install PrusaSlicer
- In the Mainsail interface (<http://marathon.local>) on 'MACHINE' find the 'PrusaSlicer\_Profiles', download it and unzip it -- refer to image A.
- They can be also downloaded from Formbot internet site: <https://www.formbot3d.com/>
- Simply copy the contents of this archive into the configuration folder of PrusaSlicer.
- You can access the configuration folder directly from the 'Help' menu within PrusaSlicer -- refer to image B
- If desired, the same profiles can be also used in 'SuperSlicer': (<https://github.com/supermerill/SuperSlicer/releases>)
- In order to be able to send the print files from PrusaSlicer directly to the printer you have to type the printer IP in the printer profiles -- refer to image C
- The IP is displayed in an submenu from TFT controller – See chapter 4.2, picture C



## 4.9 Orbiter 2.0 extruders

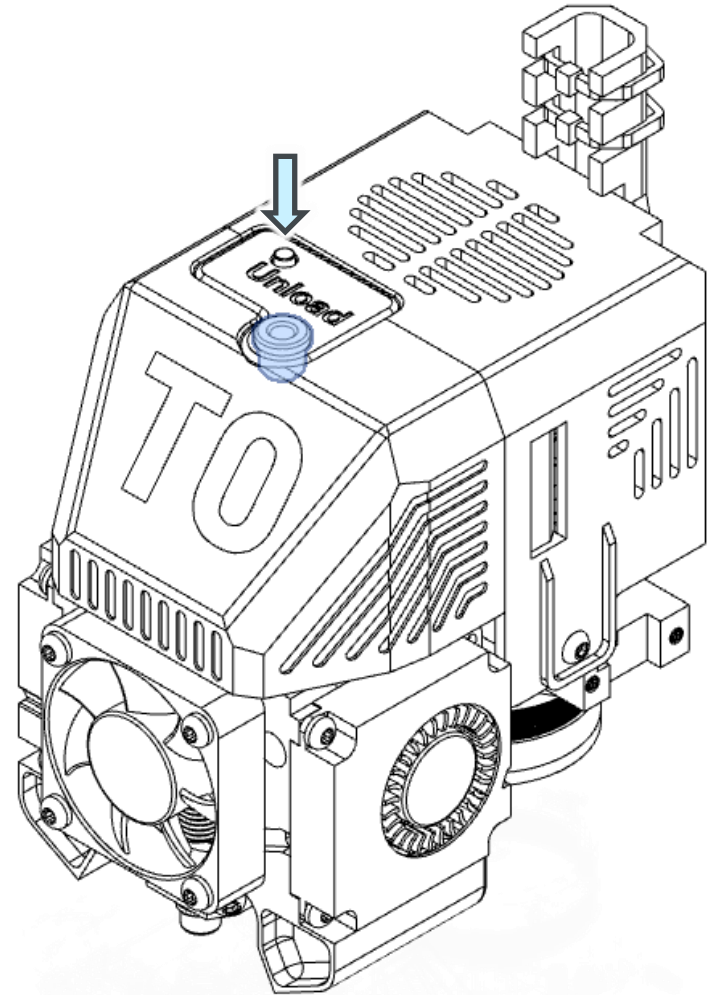
- The Marathon 3D printer is equipped with Orbiter 2.0 extruders, which are lightweight and highly capable. These extruders are designed to operate maintenance-free.
- However, if there arises a need to access the extruder for any reason, the process is straightforward. Simply press together the back corners of the front cover and then remove it -- refer to image A and B
- Orbiter 2.0 internet page:  
<https://www.orbiterprojects.com/orbiter-v2-0/>



Many thanks to Dr. Róbert Lőrincz for offering the Orbiter extruders and intelligent filament sensors to the 3D printing community. His contributions are greatly appreciated and have significantly enhanced the 3D printing experience for enthusiasts and professionals alike.

## 4.10 Orbiter filament sensors

- Each Orbiter 2.0 extruder is equipped with a filament sensor that, in addition to the 'Filament runout' function, enhances the convenience of filament loading and unloading.
- When '**Filament Runout**' is detected:
  - LED turns red
  - Printer enters in Pause mode
  - Filament will be unloaded
  - Printer waits
- To '**Unload**' the filament
  - Push the button
  - The LED blinks orange
  - Hotend heats up
  - Filament will be unloaded
- To '**Load**' the filament
  - Stick the filament in the extruder and wait 2 sec
  - LED turns green
  - The extruder will grab the filament and push it down approx. 10mm
  - Hotend heats up
  - Filament will be loaded and material will be purged
- Orbiter filament sensor internet page:  
<https://www.orbiterprojects.com/orbiter-filament-sensor/>

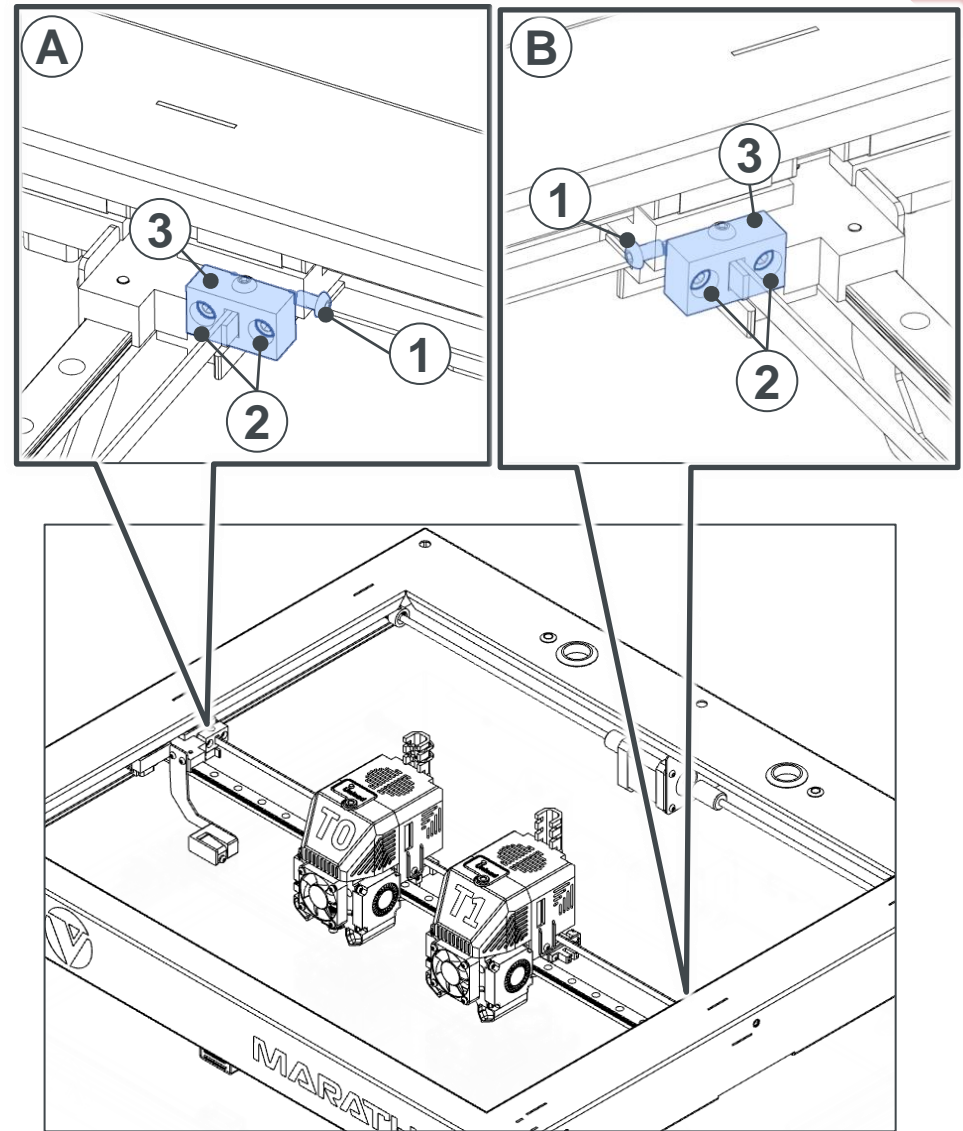


Many thanks to Dr. Róbert Lőrincz for offering the Orbiter extruders and intelligent filament sensors to the 3D printing community. His contributions are greatly appreciated and have significantly enhanced the 3D printing experience for enthusiasts and professionals alike.

# 4.11 Adjusting belt tension X-axis

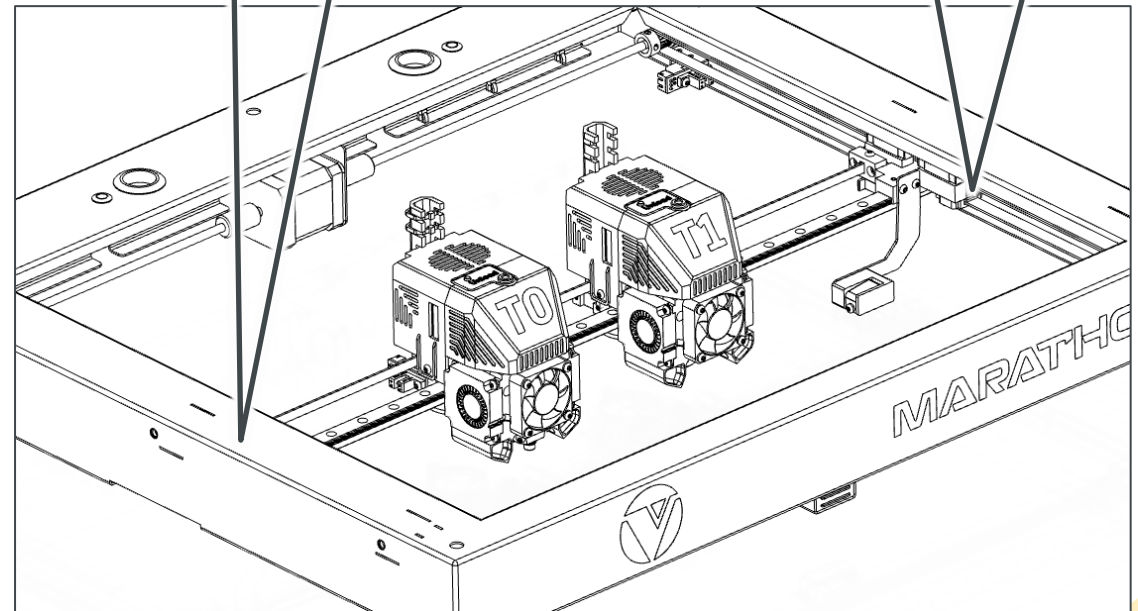
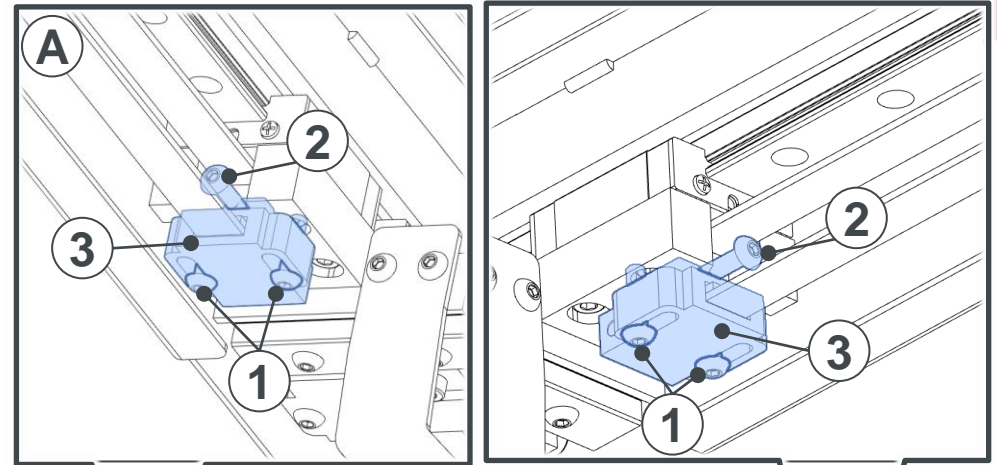
- At some point in time, it may be necessary to adjust the belt tension. This can be easily accomplished by following the steps below.
- At both ends of the belt along the X-axis, you will encounter the same belt tension system.
- Tension the belt on one side only; this should be sufficient for most cases. Only proceed to tension the second side if the achieved tension proves to be unsatisfactory.
- The tensioning process proceeds as described below (refer to image A and B):
  - Loosen the safety screw ①
  - Carefully and symmetrically tighten the screws ② from the belt fixation ③ until a proper tension is achieved
  - Tighten safety screw ① back

**!** Ensure that you do not over-tighten the belts, as this could result in premature wear and a decrease in printing quality.



# 4.12 Adjusting belt tension Y-axis

- The parts involved tensioning the Y-axis belts are located in front of the gantry carriages.
- The tensioning process is carried out as described below for both belts, on the right and left sides of the Y-axis (refer to image A and B):
  - Loosen the safety screws ①
  - Carefully tighten the screw ② from the belt fixation ③ until a proper tension is achieved
  - Tighten safety screws ① back
- Ensure that both the left and right belts are tensioned equally!



**!** Ensure that you do not over-tighten the belts, as this could result in premature wear and a decrease in printing quality.

# 4.13 Clock setup on TFT screen

- On the TFT screen, the displayed time is sourced from the Debian system on which Klipper runs, and it is highly likely that it may not be accurate.
- To adjust it, you need to establish an SSH connection to your printer.
- This can be easily done directly from Windows or using a SSH client like Putty for example (<https://www.putty.org/>)
- Here are described the steps to follow with Windows.
- Open **'Command Prompt'**
- Type **'ssh biqu@<printer IP>'**. The IP is displayed in an submenu from TFT controller – See [chapter 4.2](#), picture C
- You will be asked for a password. The password is: **'biqu'**
- Type **'sudo timedatectl set-timezone "<your continent>/<your city>"**
- List with all the time zones in the world: [https://en.wikipedia.org/wiki/List\\_of\\_tz\\_data\\_base\\_time\\_zones](https://en.wikipedia.org/wiki/List_of_tz_data_base_time_zones)
- Type **'date'** if you want to check it
- Now you can close **'Command Prompt'**
- The TFT screen will not promptly update the displayed time; a printer restart will be necessary for the changes to take effect.

```
CA: biqu@BTT-CB1: ~
Microsoft Windows [Version 10.0.19045.3324]
(c) Microsoft Corporation. All rights reserved.

C:\Users\marin>ssh biqu@192.168.178.27
biqu@192.168.178.27's password:

[ASCII art of a printer]

Welcome to BTT-CB1 2.3.3 Bullseye with Linux 5.16.17-sun50iw9

System load: 32%           Up time: 6:57
Memory usage: 21% of 986M  IP: 192.168.178.27
CPU temp: 54°C           Usage of /: 86% of 4.7G

biqu@BTT-CB1:~$ sudo timedatectl set-timezone "America/Los_Angeles"
biqu@BTT-CB1:~$ date
Sat 26 Aug 2023 04:54:37 AM PDT
biqu@BTT-CB1:~$
```

# Marathon

# Happy printing!



**Contact us:**

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