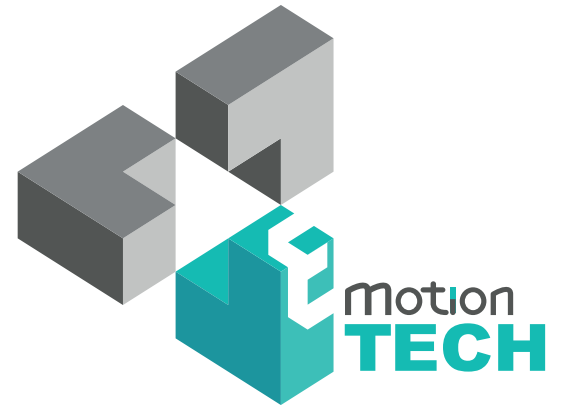


# $\mu$ delta

ASSEMBLY INSTRUCTIONS  
REV 1.1



---

# INTRODUCTION

---

## INTRODUCTION

### • Target :

Propose a visual guide of the different steps to build and use a µdelta printer

### • Designers :

Hugo Flye  
Thomas Batigne  
Antony Soury

### • Autors :

eMotion Tech : <http://www.reprap-france.com>

Antony Soury  
Loic Déchaseaux  
Hugo FLye  
Thomas Batigne  
Anthony Berna

### • Photographics Credits :

Pictures and 3D représentations made by eMotion Tech :  
<http://www.emotion-tech.com>  
Pictures Director : Antony Soury

### • Sources :

<http://reprap.org/wiki/reprap>  
<http://www.repetier.com/>

### • Licenses :

µdelta : CC BY-NC-SA 4.0  
This document : CC BY-NC-SA 4.0  
<http://creativecommons.org/licenses/by-nc-sa/4.0/>



### • Update :

Last Update : 31/03/2015

### • Links:

You can found more informations on the following links :

RepRap community : <http://reprap.org/wiki/reprap>  
Repetier-Host software : <http://www.repetier.com/>  
3D models database : <http://www.thingiverse.com/>



## SUMMARY

### INTRODUCTION

INTRODUCTION

SUMMARY

μDELTA INTRODUCTION

SAFETY INSTRUCTIONS

### ASSEMBLY

BILL OF MATERIALS

A. Printed parts

B. Acrylic parts

connecting rods

C. Smooth rods and

D. Mechanical parts

E. Screws, nuts and washers

F. Electronic

G. Others

H. Hexagon Kit

I. Options

TOOLS

### MECHANICAL ASSEMBLY

### 2 ELECTRONIC ASSEMBLY

### 3 ADD-ONS

4 HEATED BED

5 1. Hardware update

7 2. Software update

### 8

9

9

9

10

10

10

10

11

11

12

13

14

### 15

51

59

60

60

65



## μDELTA INTRODUCTION

μdelta is developed by eMotion Tech. This new 3D printer is easy to assemble and to operate without loss of performances.

### Data sheet :

### DATAS

- Printing surface Ø110x190mm
- Layer height [0.1-0.35]
- Electronic type Teesylu + 4 Stepsticks (integrated firmware)
- Motor NEMA 17
- Belt type GT2
- Extrusion Head Hexagon 0.4
- Dimensions : Height 440mm, Width 250mm, Depth 250mm
- Nominal printing speed 70mm/s
- Max speed : 200mm/s
- Nominal speed : 130mm/s
- Average precision (X,Y) 100 microns
- Average precision (Z) 50 microns
- Operating system Windows XP, Vista, 7,8, Ubuntu 12+
- Consumable PLA 1.75mm (or ABS and others plastics with heated bed option)
- Provided with Repetier preset for μdelta
- Connectivity USB
- Power supply provided, 12V, 120W

### STRUCTURE

- Lasercut Acrylic 5mm
- Extruder core printed in ABS 0.2mm
- Smooth rod 8mm
- Manufactured plate plywood 12mm

### ERGONOMY

Easy to mount : A 3D printer kit with an intuitive assembly

- Simple electronic, no soldering
- Easy wiring and assembly
- Belt adjustment with ergonomic belt tensioners

Easy to calibrate : A simplified software

- Fully software calibration
- Pre-configured open-source software (no firmware upload required, Repetier Host and Slic3r pre-configured)

Easy to maintain

- Quick height ajustement with the software
- Easy to reload the filament

## **OPTIMISATION AND UPGRADE** (Options and Développements soon available)

You can improve the  $\mu$ delta by adding the following options

- Spool holder with fan
  - LCD screen controller to print without computer
  - Lighting with circular LED
  - Heated bed
-

## SAFETY INSTRUCTIONS

### General safety instructions

**NEVER LEAVE THE PRINTER WORKING WITHOUT SUPERVISOR.**

The nozzle can reach 270°C, **to avoid burning, do not touch the nozzle while the printer is working.**

A supervisor is needed when the printer is used with young people.

### KEEP PRINTER AWAY FROM CHILDREN AND ANIMALS

**Operate in a ventilated room.** Plastic fumes effects are not known. In case of use in a closed room, we recommend the use of an extractor fan.

The addition of protections is your own responsibility. Safety can be improved by :

- An emergency stop button
- Housing protection
- Smoke detector

### CE marking

µdelta is a 3D printed kit. It includes all the parts you need for assembling but does not include additional protections.

### Electrical safety

The power supply provided is labelled CE. The power supply is protected against short-circuit and do not need any modifications. The µdelta operate at voltage of 12V and is not concerned by the low voltage directive.

### Further informations

Information above are not exhaustive.

We used sources of informations we consider as reliable. However, we cannot guarantee that all these information are true and complete.

We assume no liability for loses, injuries or damages due to assembly, transporting, storage or removal of the product.

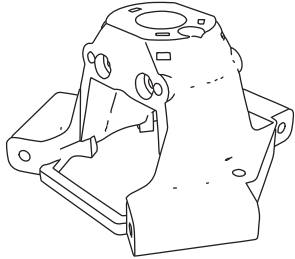
---

# ASSEMBLY

---

## BILL OF MATERIALS

### A. Printed parts



1x Core

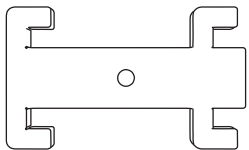


1x Filament  
Guide

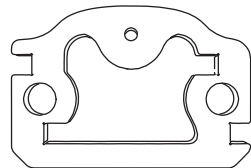
Acrylic parts can be covered with protection and it may remain pieces of plastic. Remove it before use.

We provide additional parts.

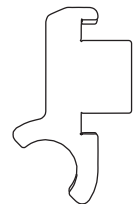
### B. Acrylic parts



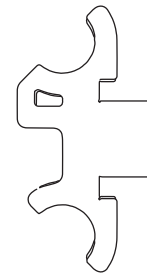
6x eM1  
**TENSIONER**



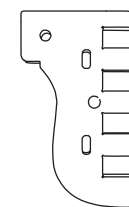
6x eM 2



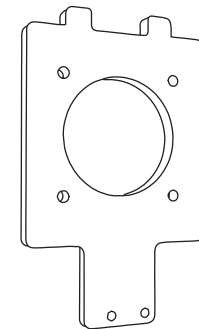
6x eM 3  
**SLIDER**



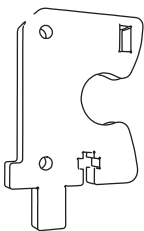
6x eM 4



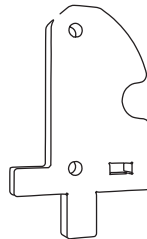
6x eM 5



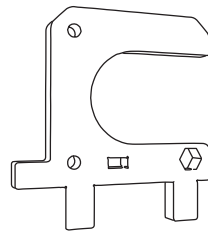
3x eM 14  
**MOTOR HOLDER**



2x eM 8  
**EXTRUDER**



1x eM 9



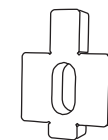
1x eM 10



2x eM 11



1x eM 12



1x eM 13

## C. Smooth rods and connecting rods



6x Ø8x400 Smooth rod



6x Connecting rod

## D. Mechanical parts



9x Linear bearing



1x Spring



3x GT2 Pulley



3x GT2 Belt



3x 624 Bearing  
1x 604 Bearing



1x Drive wheel

## E. Screws, nuts and washers



6x M2.5x16 screw  
15x M3x12 screw  
12x M3x20 screw  
4x M3x25 screw  
3x M3x30 screw  
10x M3x50 screw  
16x M4x25 screw  
1x M4x50 screw  
12x M5x30 screw  
3x Wood screw



6x M2.5 Nut  
3x M3 Wing Nut  
32x M3 Nut  
20x M4 Nut  
12x M5 Nut



1x M3 Nylstop Nut

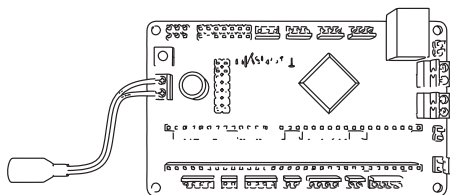


45x Ø3 Washer  
19x Ø4 Washer  
4x Ø4 Big washer

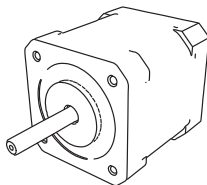


4x M3x3 Grub Screw

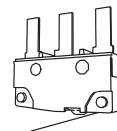
## F. Electronic



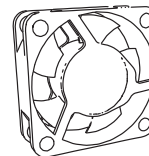
1x Teensylu



4x Nema 17 motor



3x Endstop



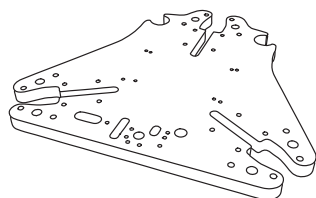
2x 3x3 Fan



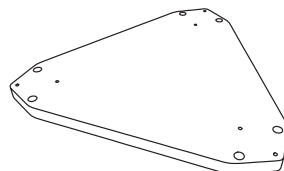
4x Stepstick


1x Power supply  
1x USB Link

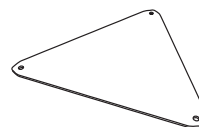
## G. Others



1x Superior frame



1x Inferior frame



1x Print bed


1x Ø4xM6  
Pneufit

1x Ø4x1/8"  
Pneufit


1x PTFE tube



3x motor Bracket



6x Shaft Support


1x Braided  
sleeve


30x Zip tie



3x Pad



1x Adhesive tape

## H. Hexagon Kit



1x Hexagon  
hot end



1x Cartridge heater



1x Thermistor



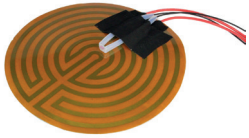
1x Allen key 3



1x Wrench 4.5



## I. Options



1x Heated bed and thermistor

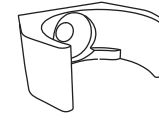
HEATED BED KIT



3x Idler



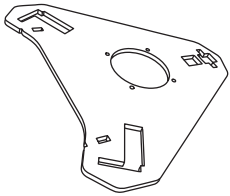
1x Tube



1x tube holder



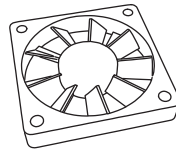
1x Polyimide tape



1x Spool holder frame



3x Spool blocks



1x 60x60 Fan



3x 624 Bearing



3x M4x20  
Screw



3x M4 Nut



3x Ø4 Washer

SPOOL HOLDER KIT



1x LED ring

LED KIT



## TOOLS

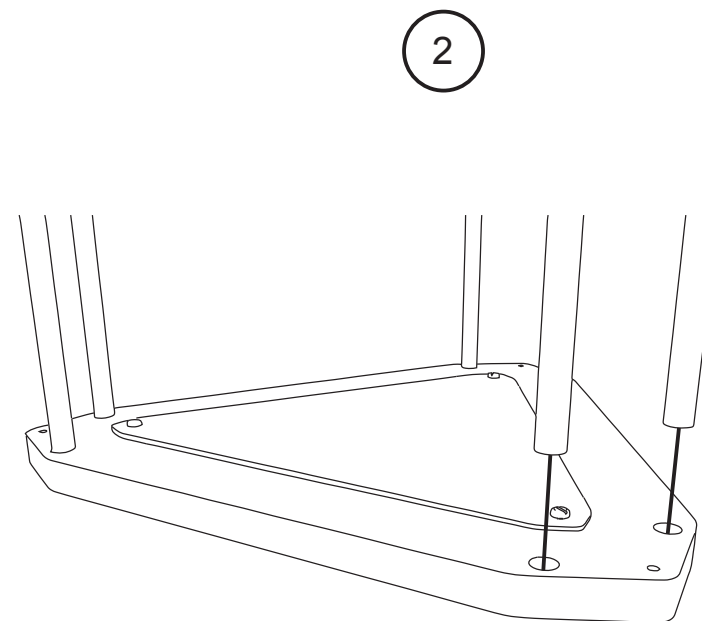
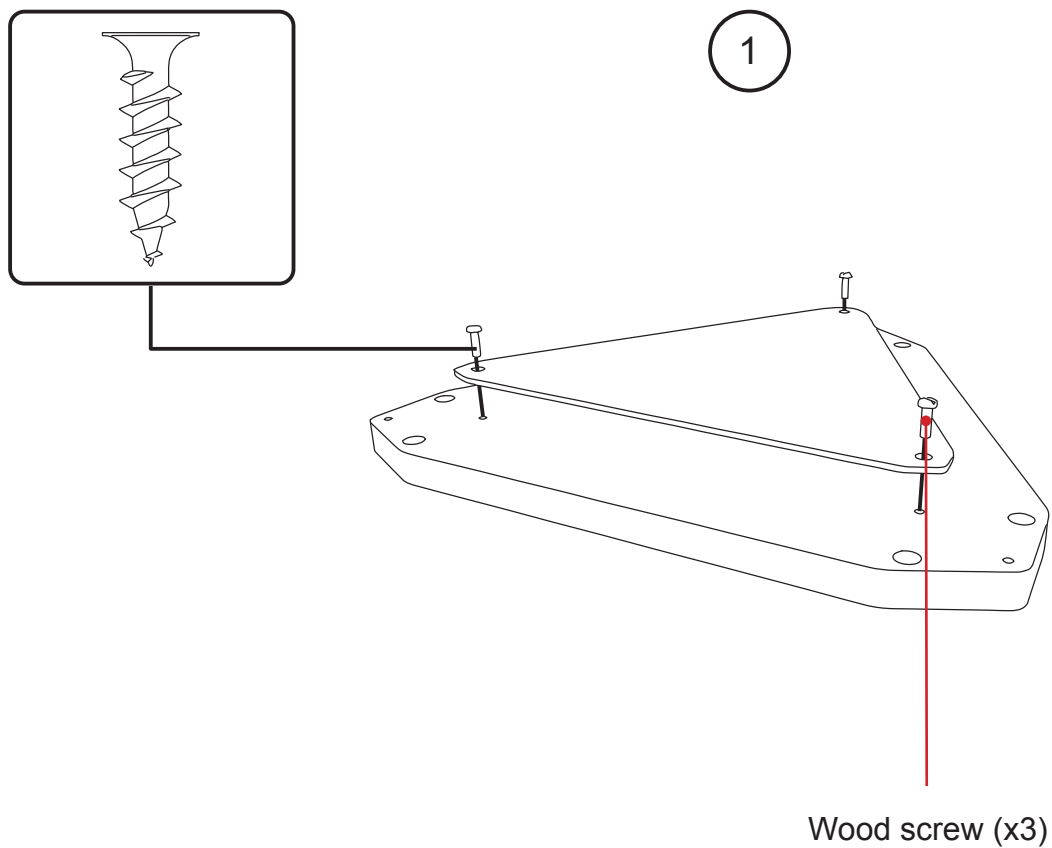
- Mallet
- Slot screwdriver
- Philips screwdriver
- Wrench 5.5 et 7
- Allen key (fournie)
- Long nose pliers
- Cutting pliers
- Utility knife
- Meter



---

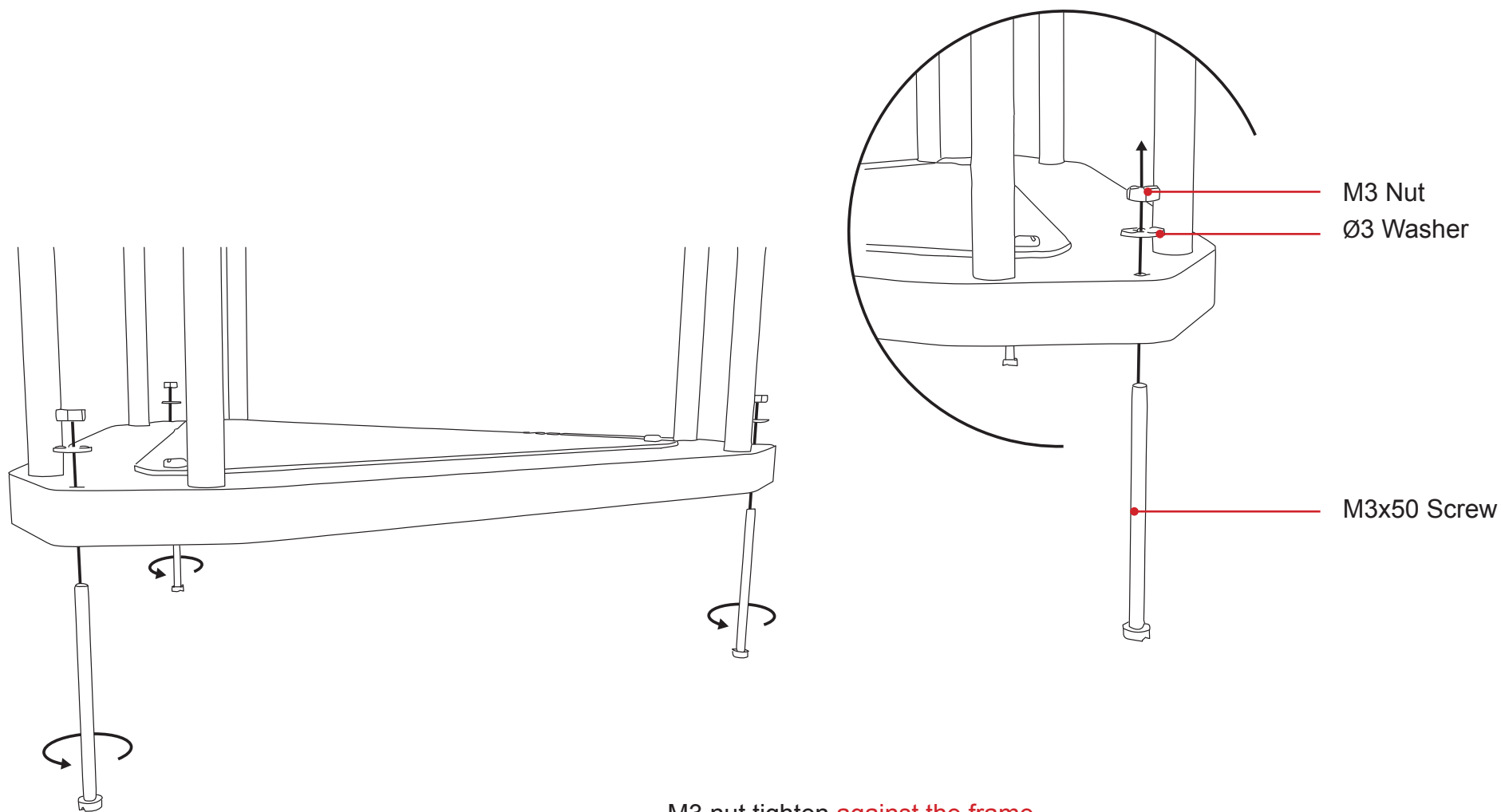
# MECHANICAL ASSEMBLY

---



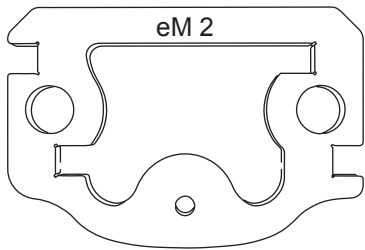
- Use a mallet to insert completely the rod **without exceeding the plate**

- **Smooth rods must be normal to the inferior frame**

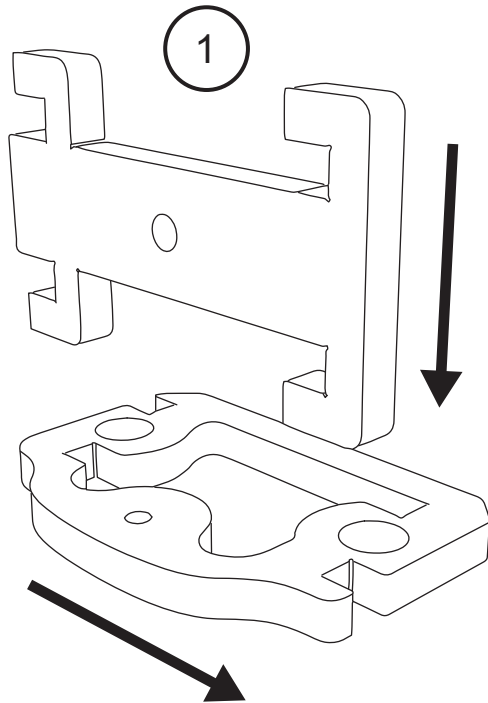


- M3 nut tighten **against the frame**
- Repeat this operation for each corners

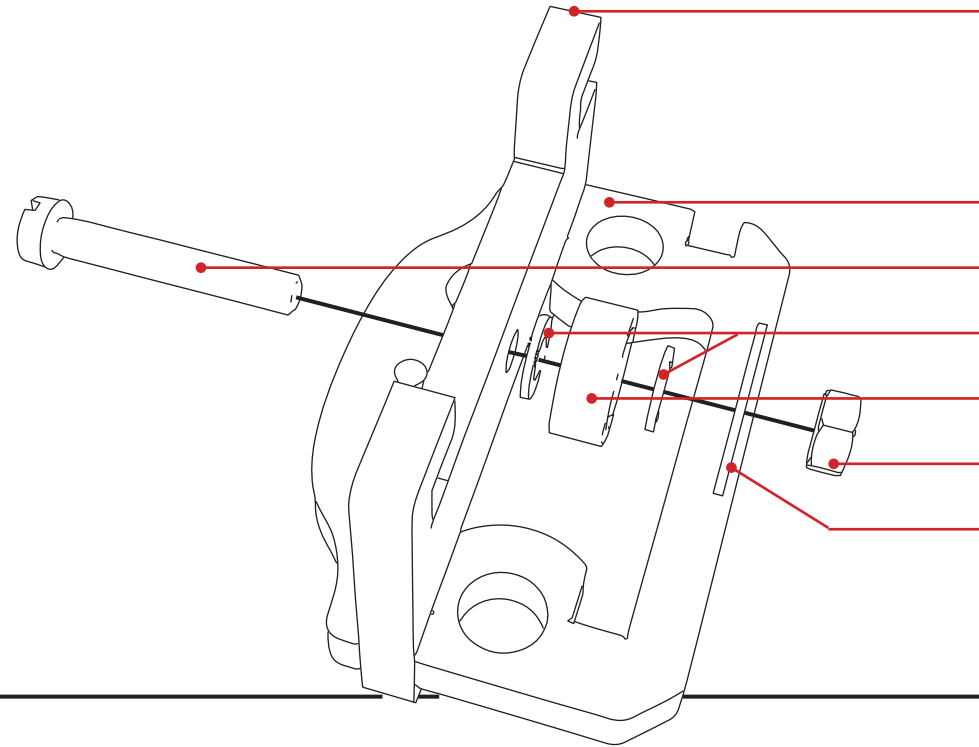
Inside the  $\mu$ delta



Outside the  $\mu$ delta



2



eM1

eM 2

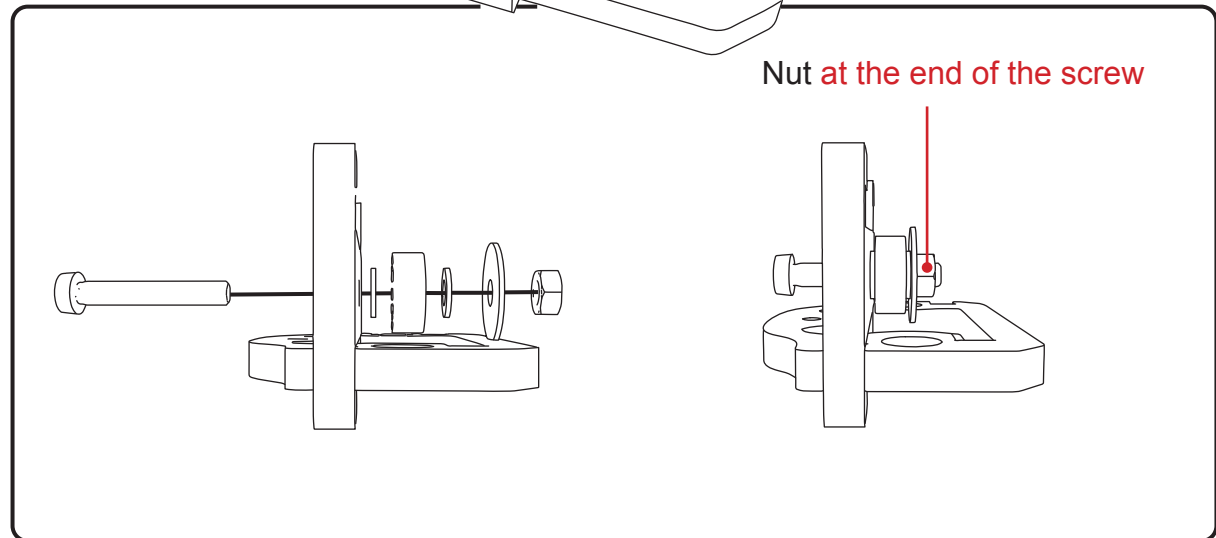
M4x25 Screw

Ø4 Washer

624 Bearing

M4 Nut

Ø4 Big washer

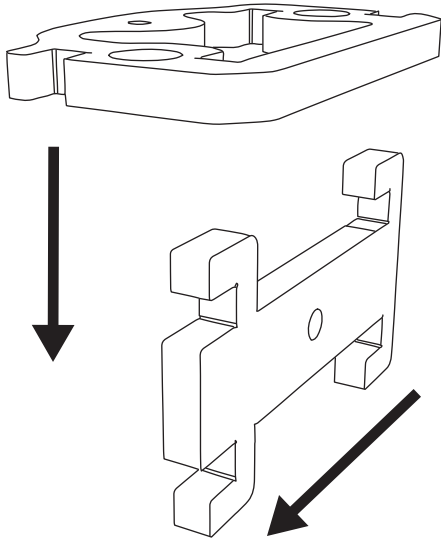


Nut at the end of the screw

**Caution : for this step, take care of the orientation of the tensioner**

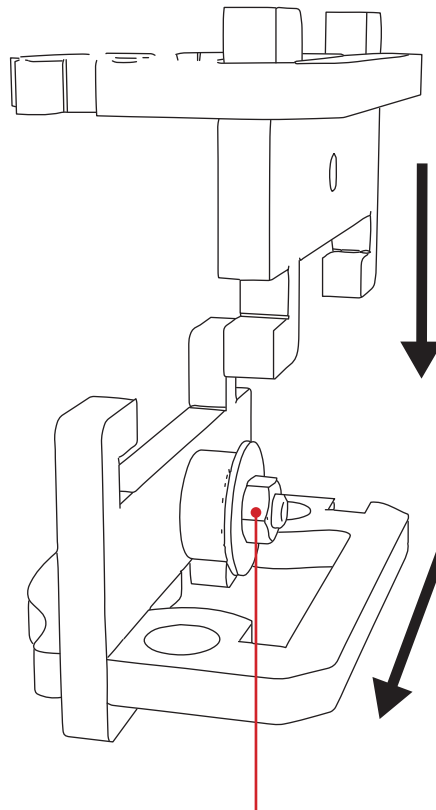
Acrylic parts can be covered with protection and it may remain pieces of plastic, remove it before use.

1



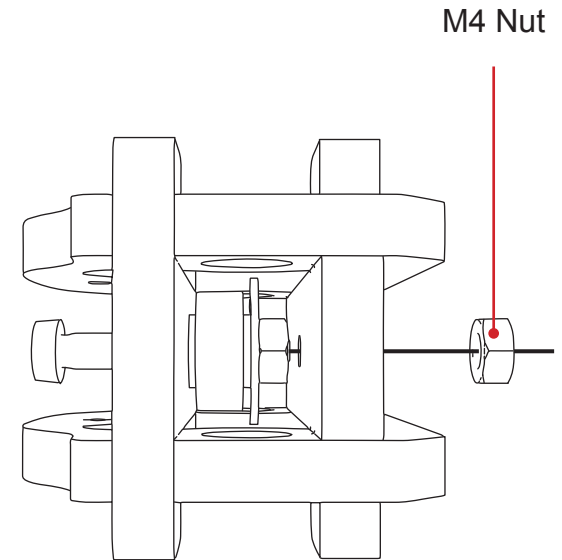
Tighten nuts moderately to avoid breaking acrylic parts

2



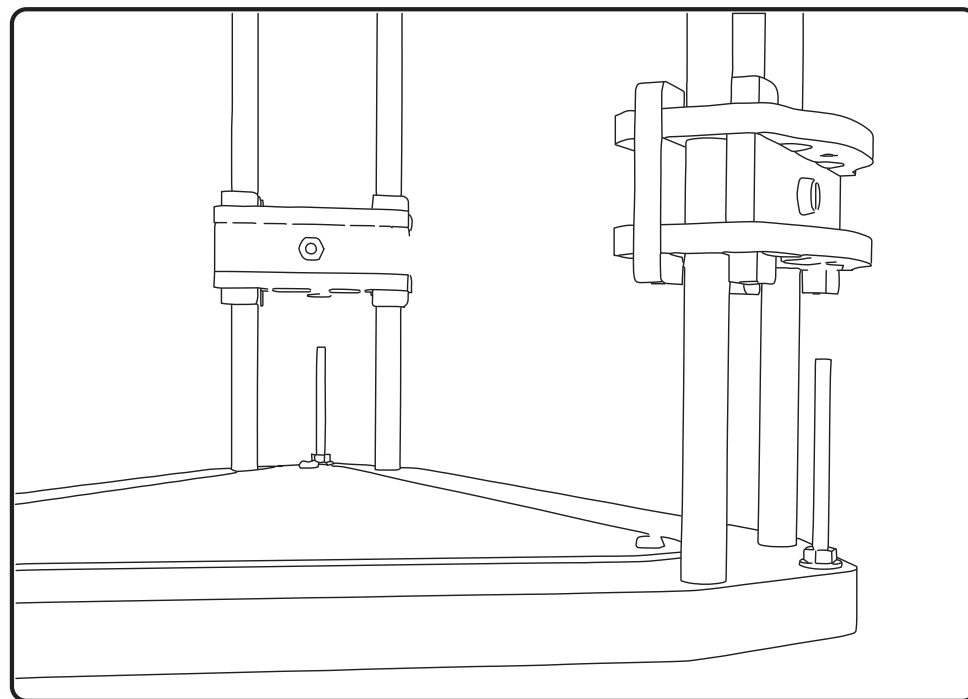
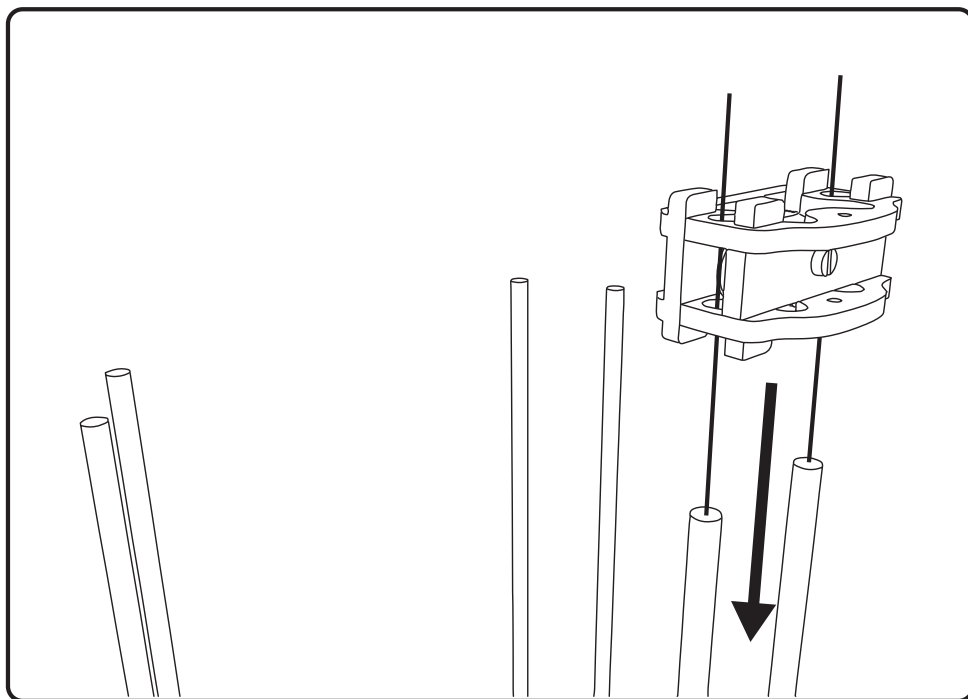
Tighten against the washer

3



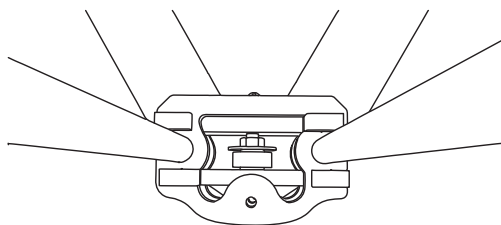
M4 Nut

**Tighten Moderately**



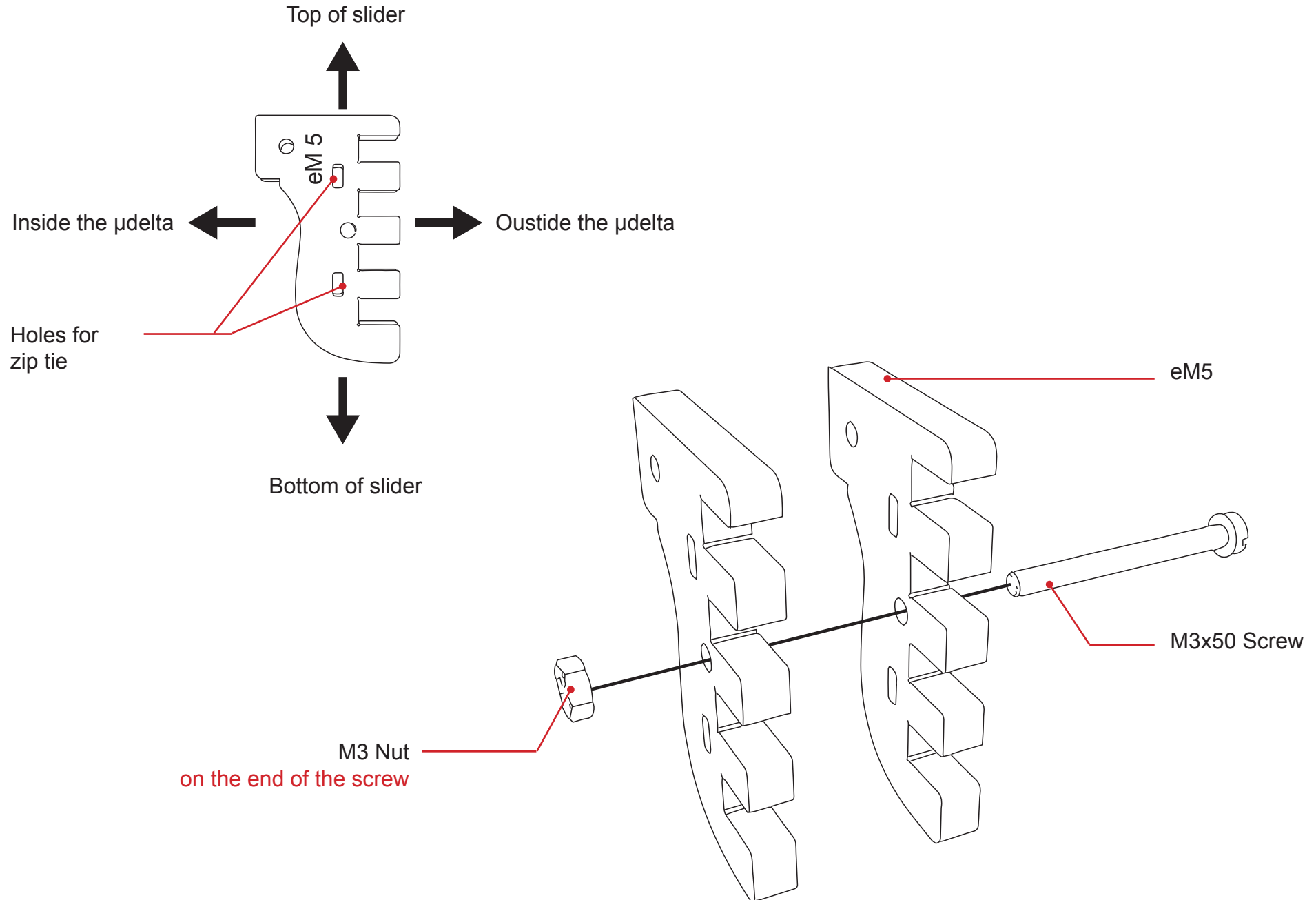
Repeat this operation for the others tensioners

Inside the  $\mu$ delta

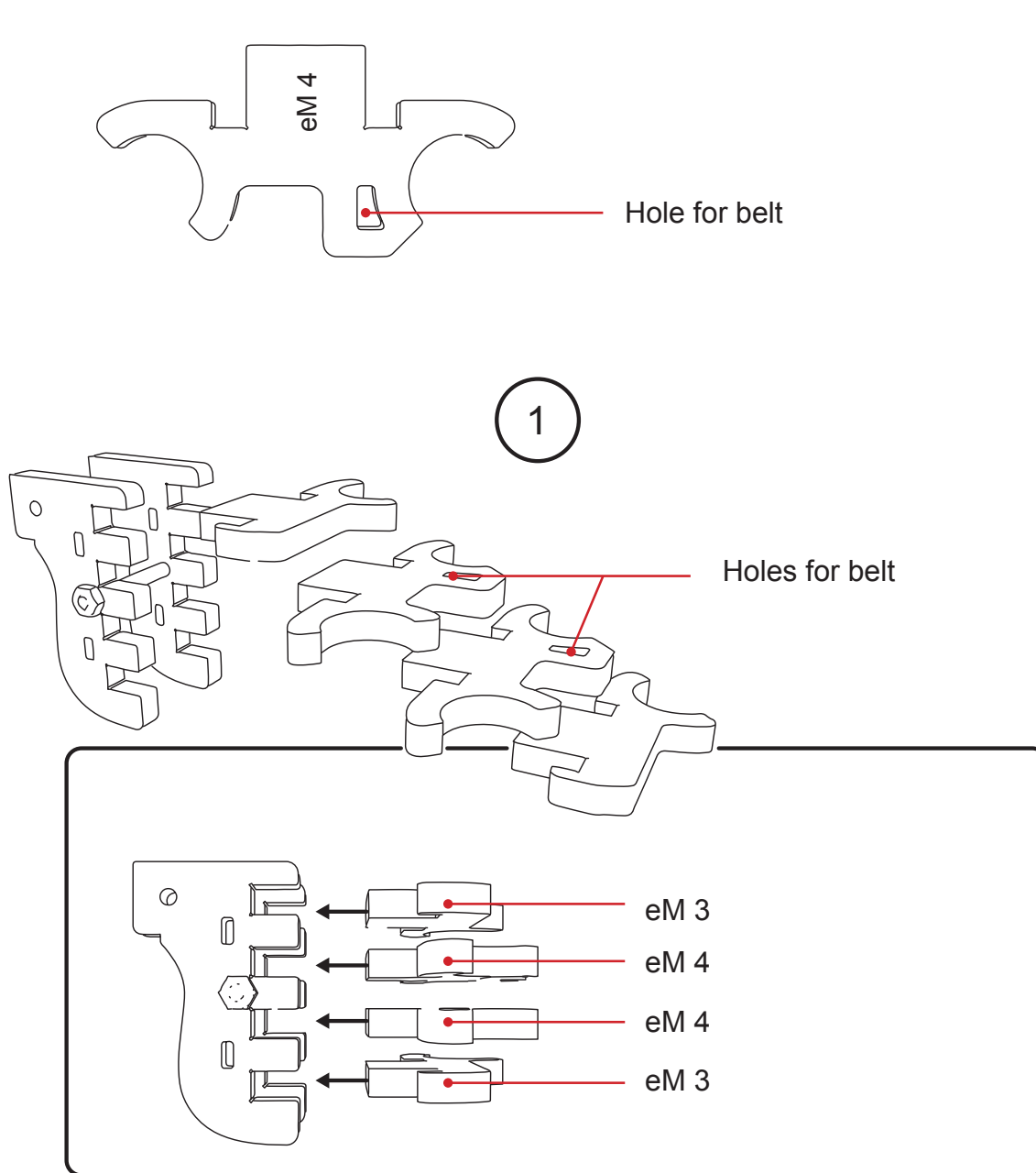


Outside the  $\mu$ delta

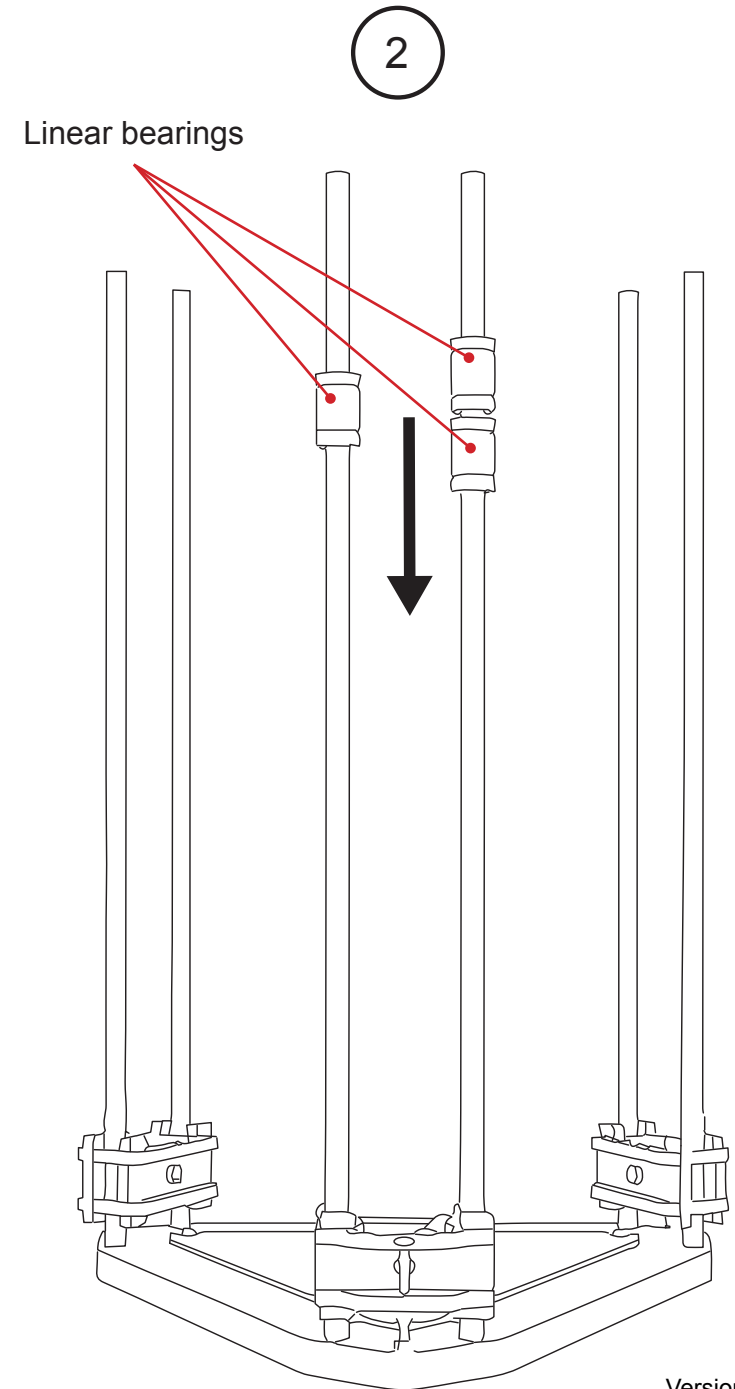




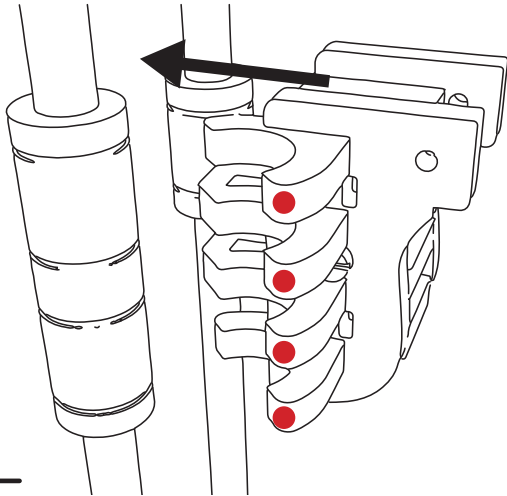
**Caution :** Assemble all sliders in the same way.



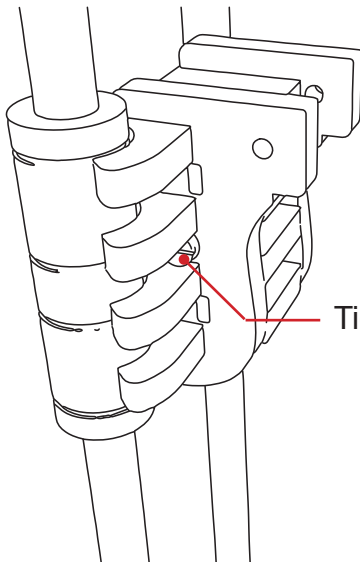
**Note :** After tightening screw, eM 3 parts may move, it is not a problem



1



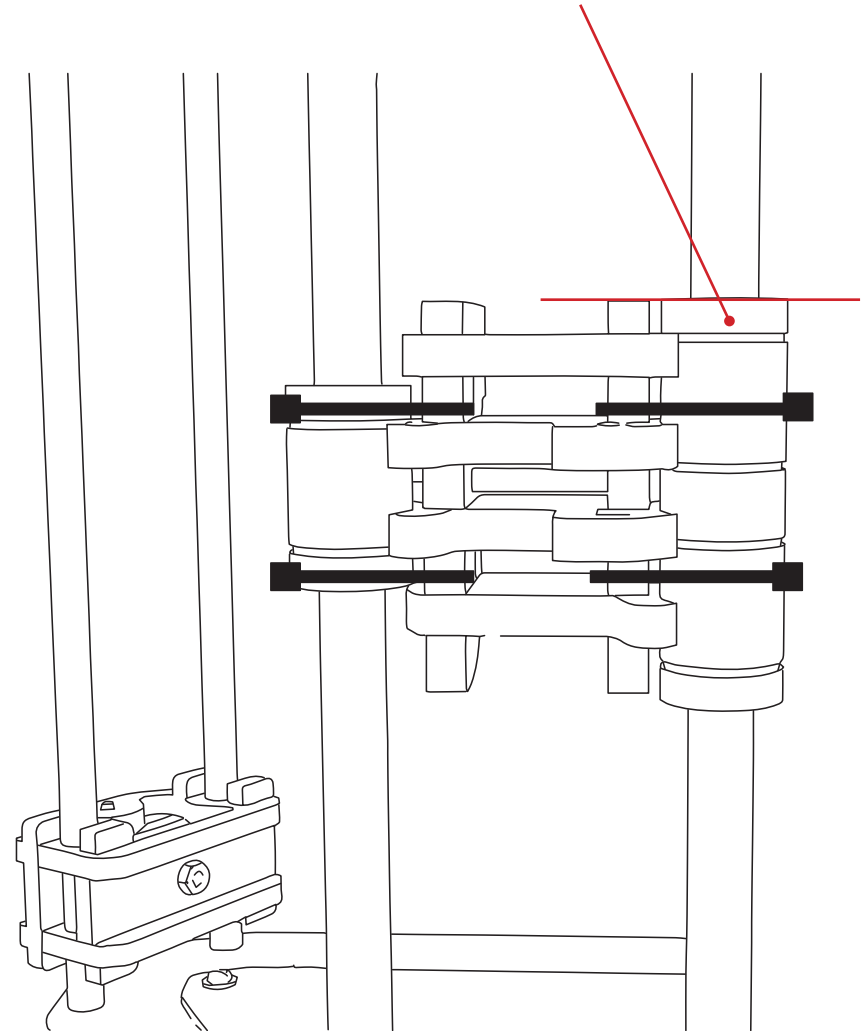
The 4 fixations must be on the **same side** than the 2 linear bearings



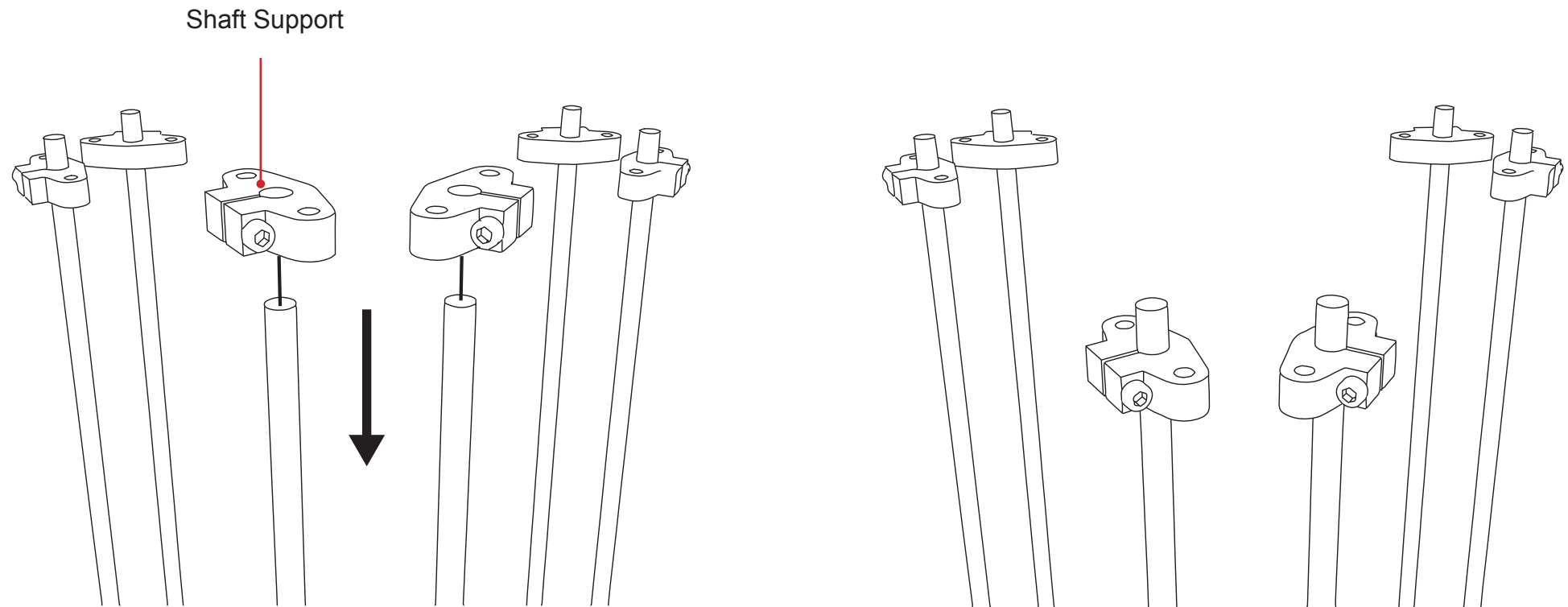
Tighten **moderately**

2

This bearing **must not exceed the slider**



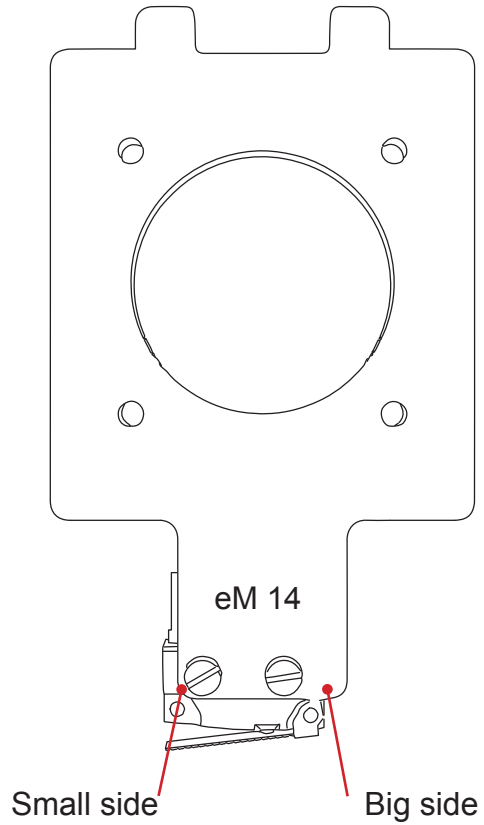
Insert a zip tie in each holes, tighten the zip ties to fasten the slider



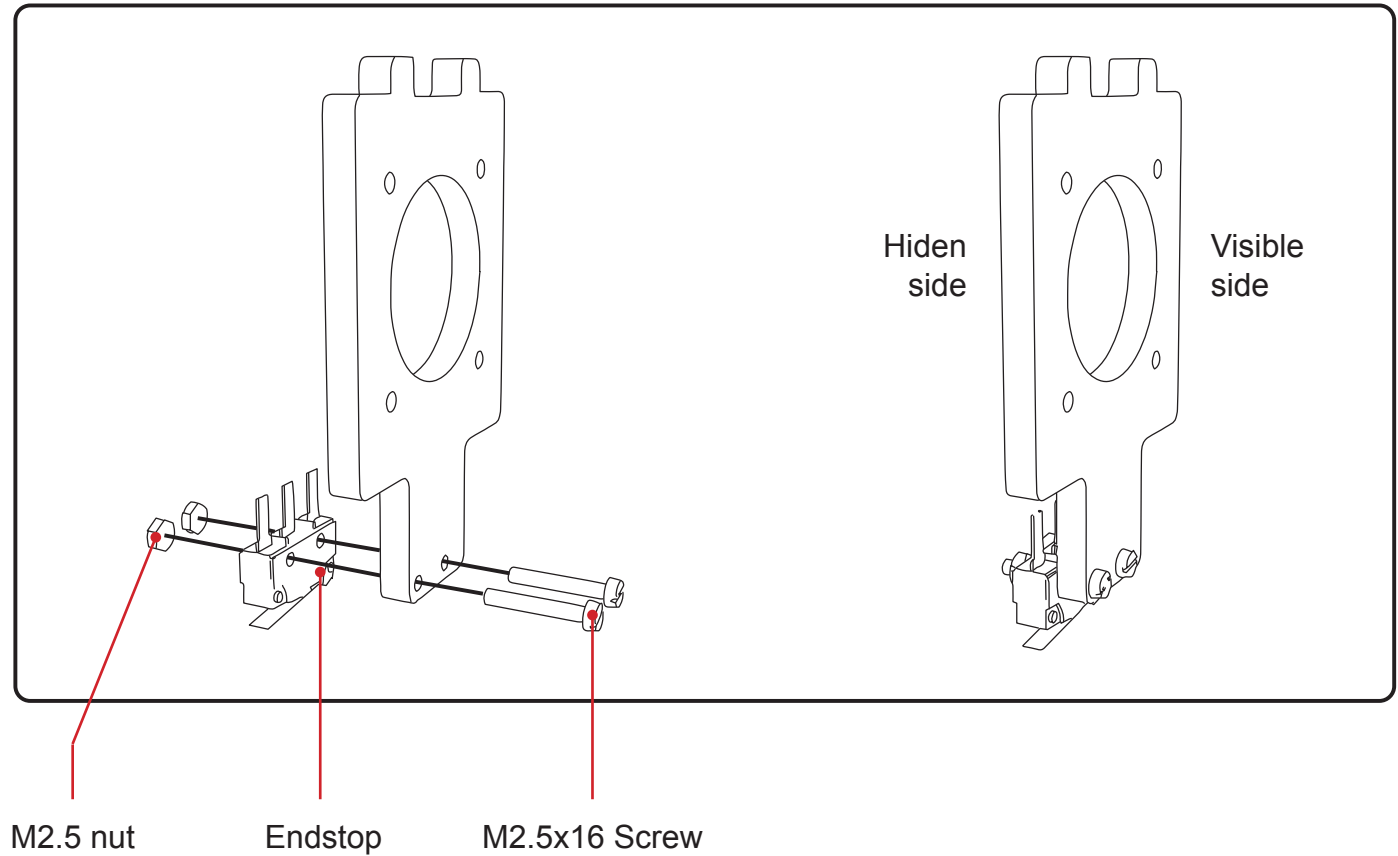
Take care of the way of shafts supports

**Note :** Do not tighten

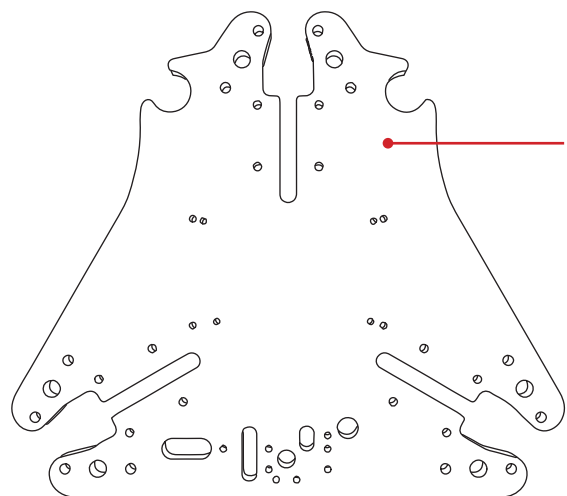
Assemble the endstop as it's show on the figure



**Note : To improve the visibility, endstops wires were not represented**



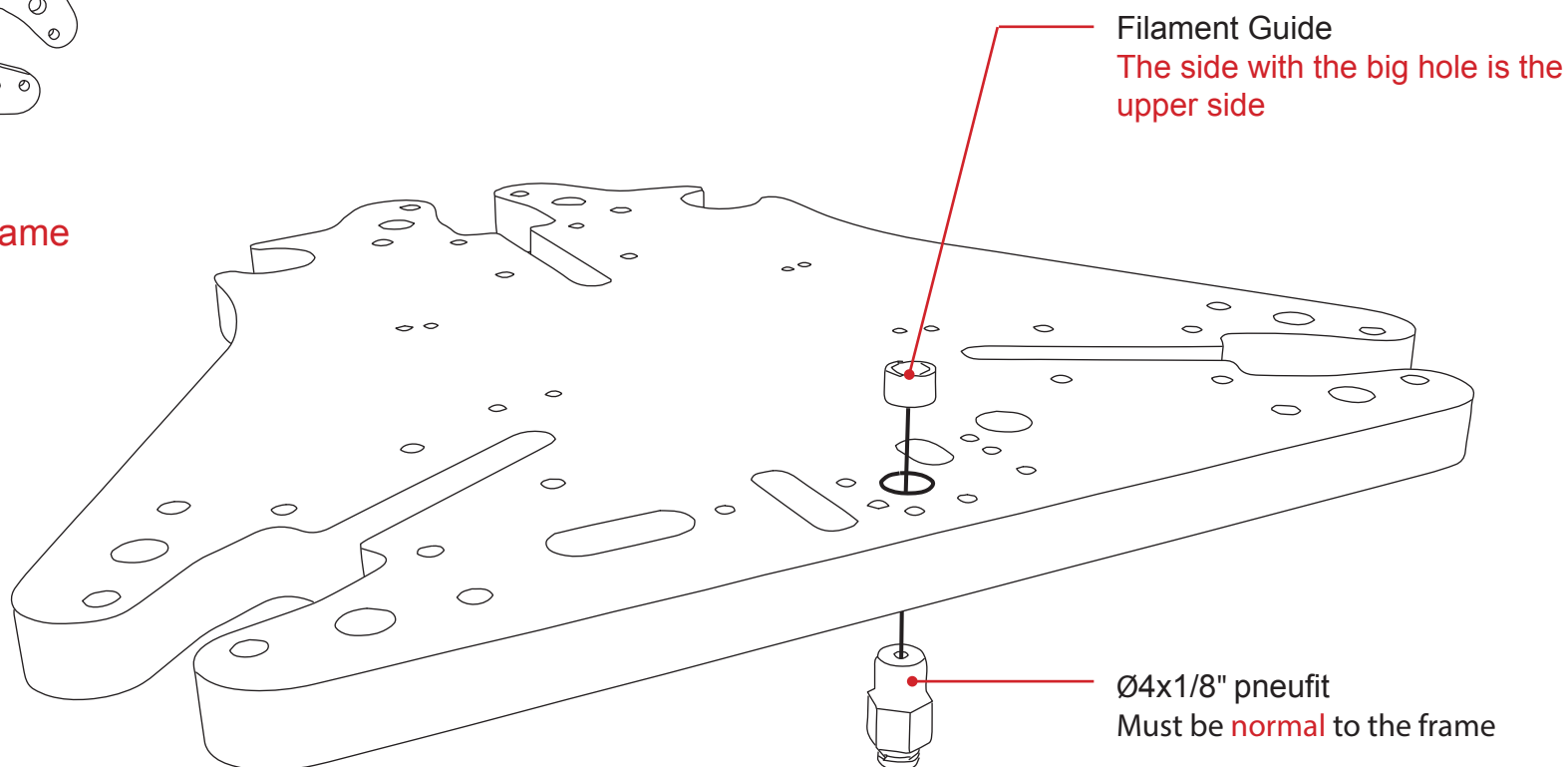
Back

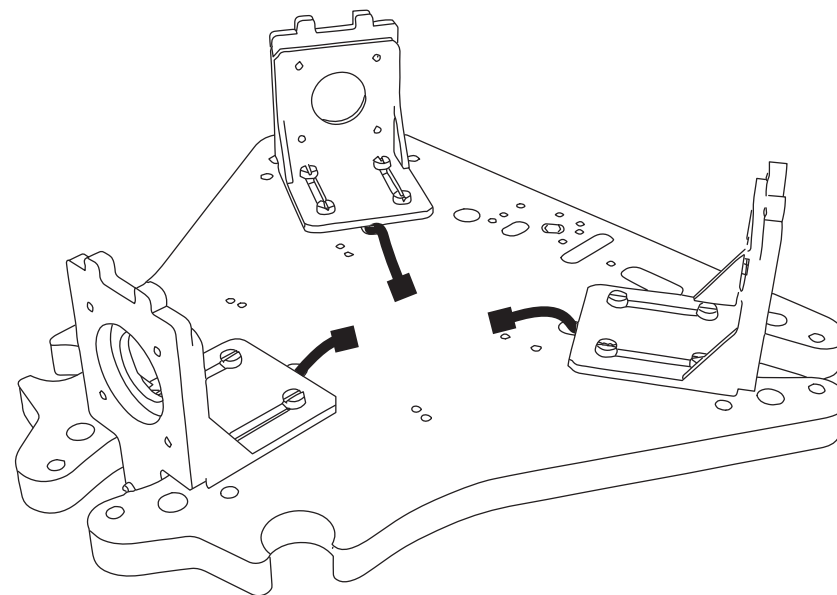
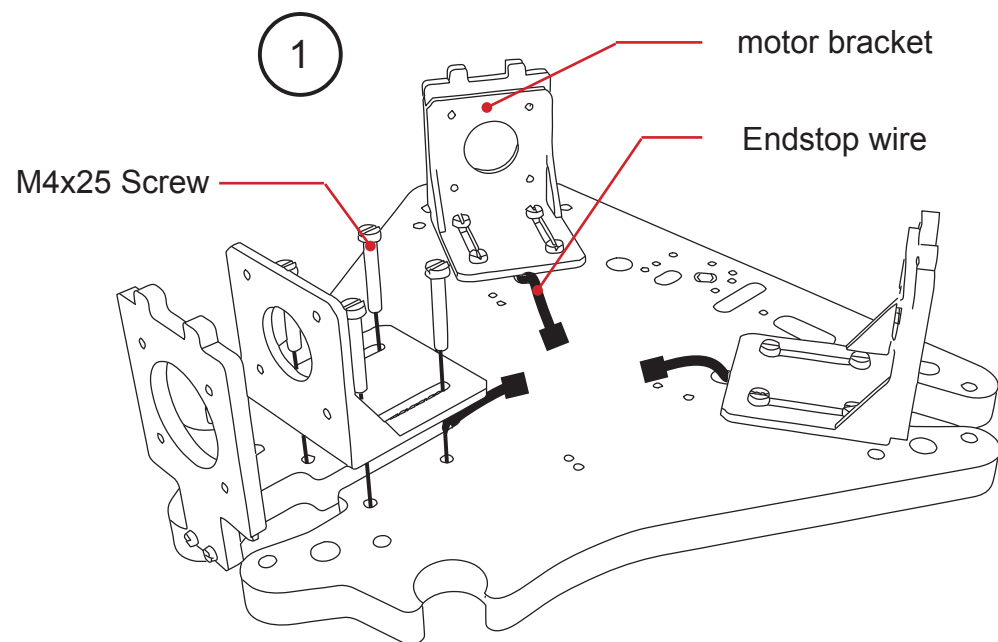


Top view

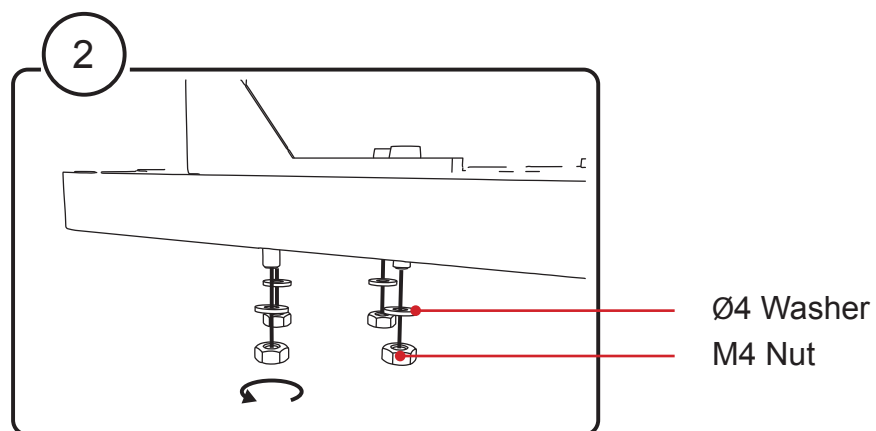
Front

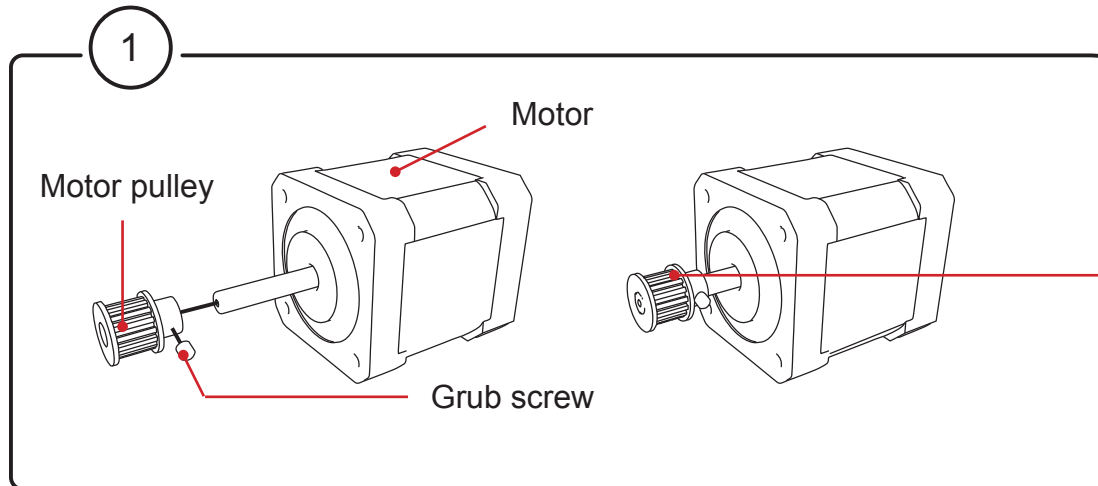
Take care to assemble the frame correctly





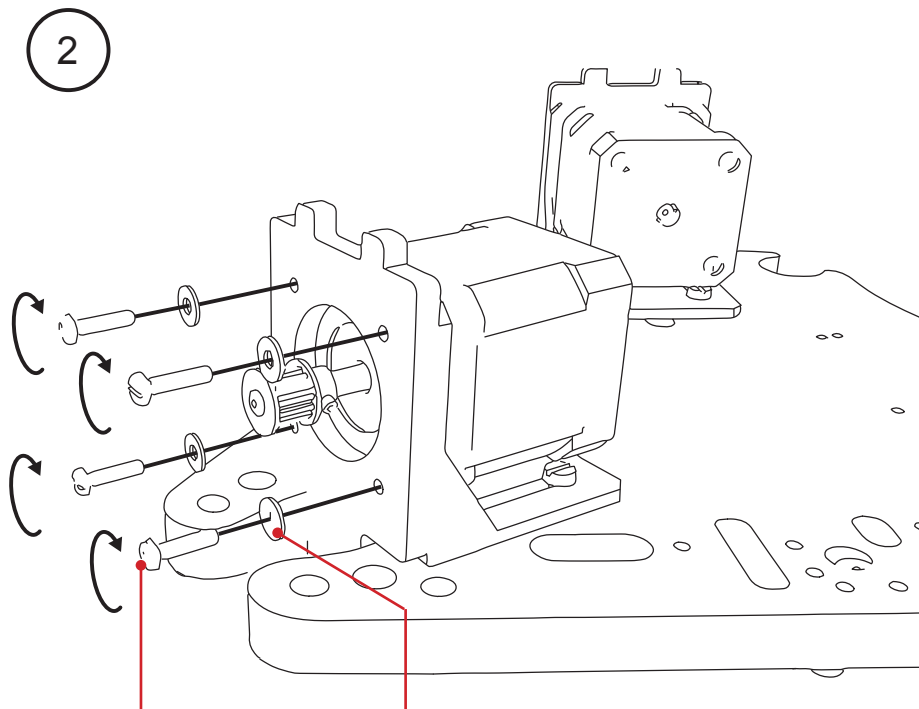
Put the endstop wires **before** the motors brackets



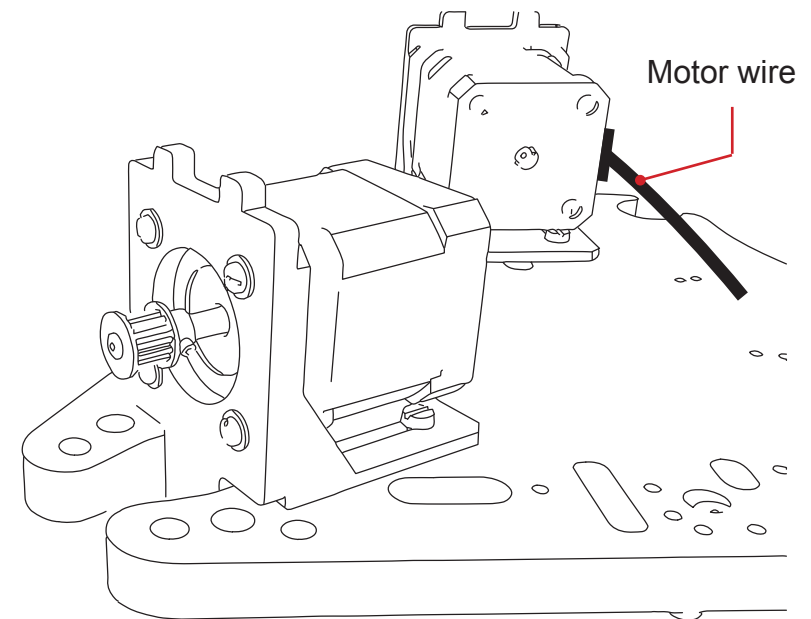


Take care of the way of the pulley  
Position the pulley at 3mm from  
the end of the motor axe

**Note :** Use the Allen key given in the kit to tighten the pulley



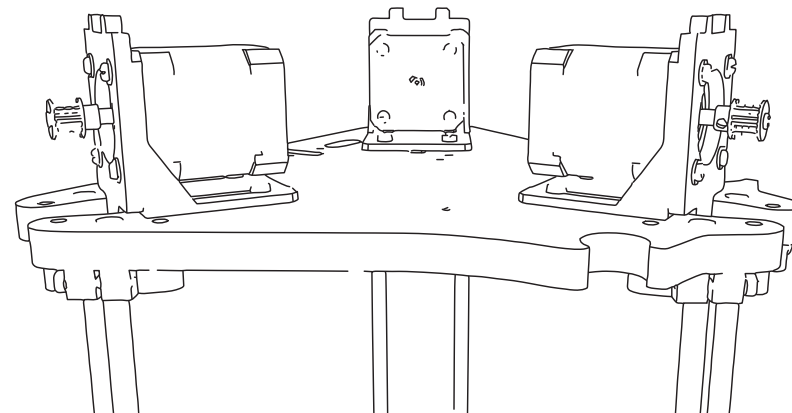
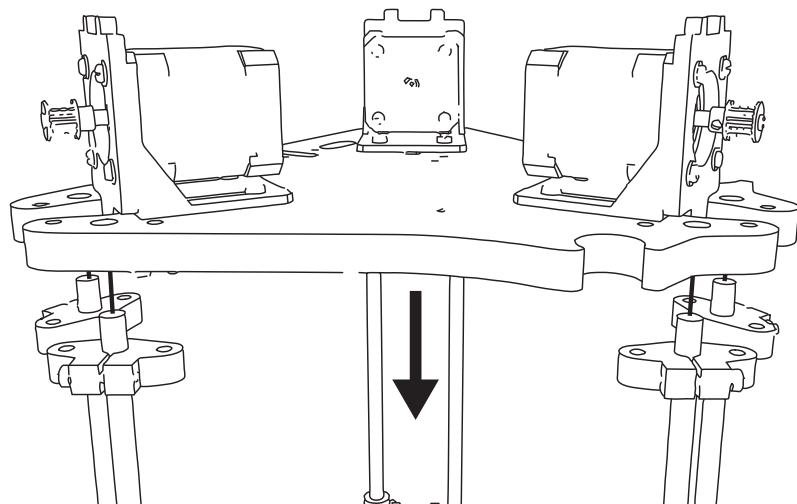
Tighten moderately



Motor wire must be on the side



1

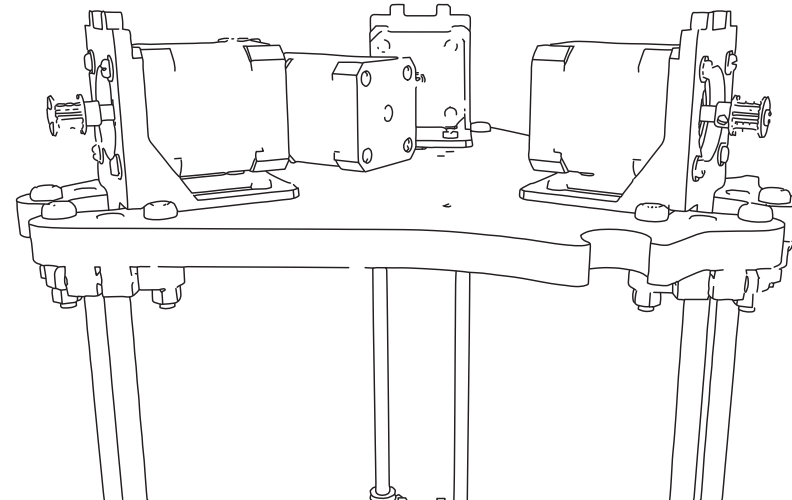
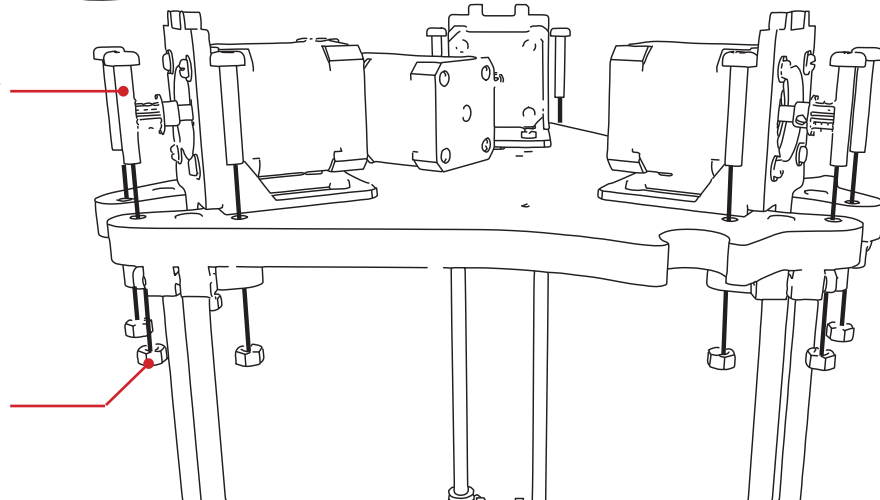


M5x30 Screw



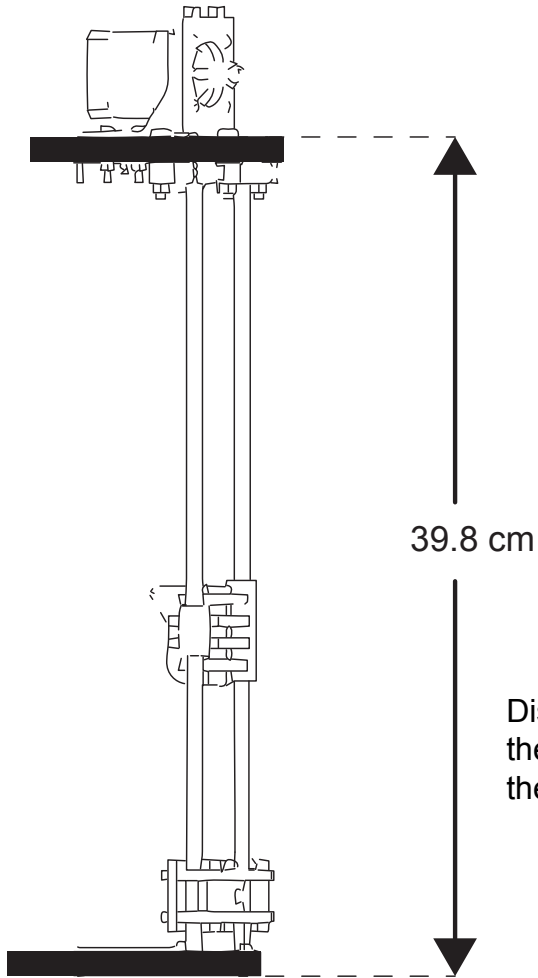
2

M5 Nut



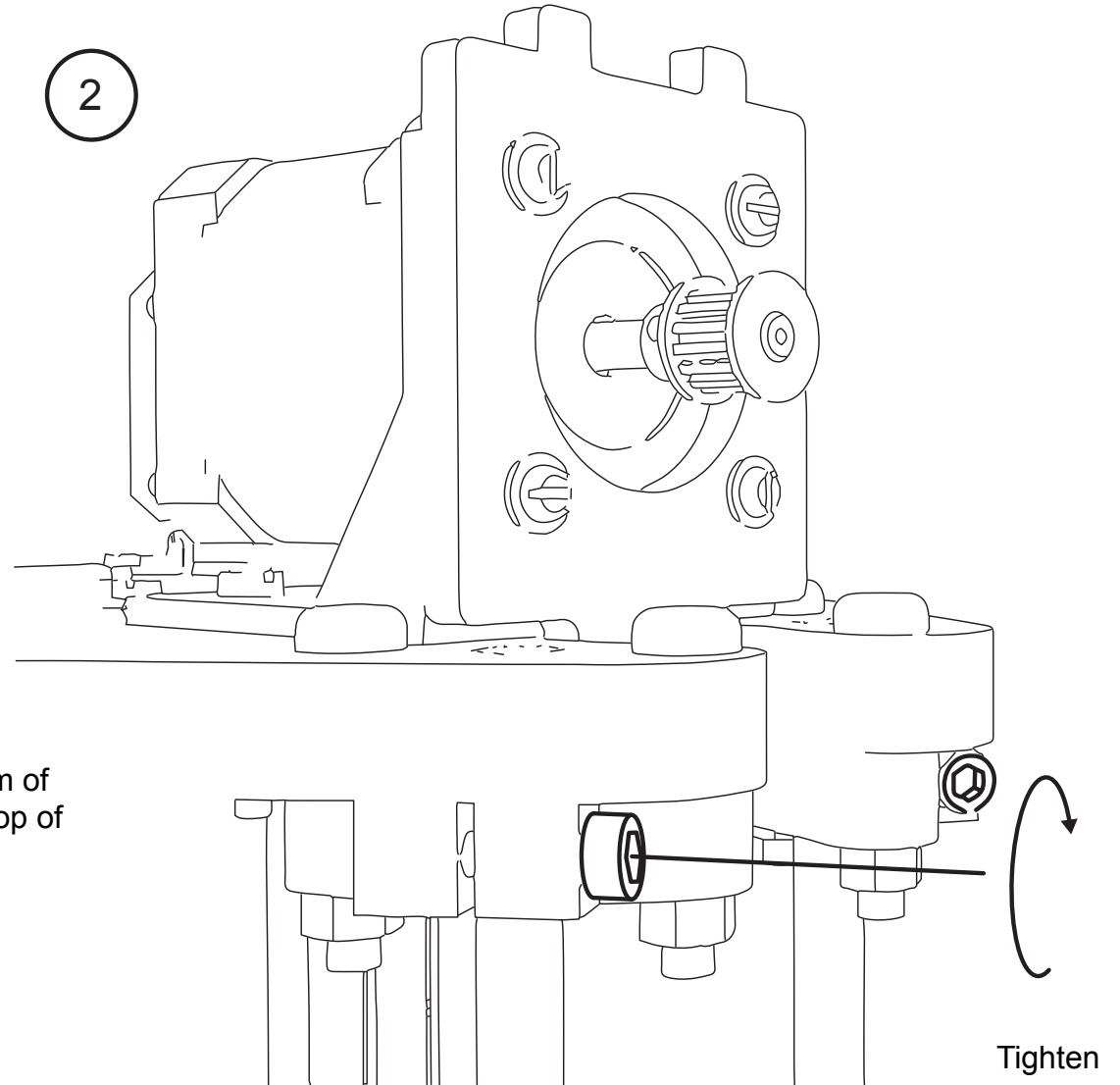
1

**Caution :** the distance must be the same for each smooth rod



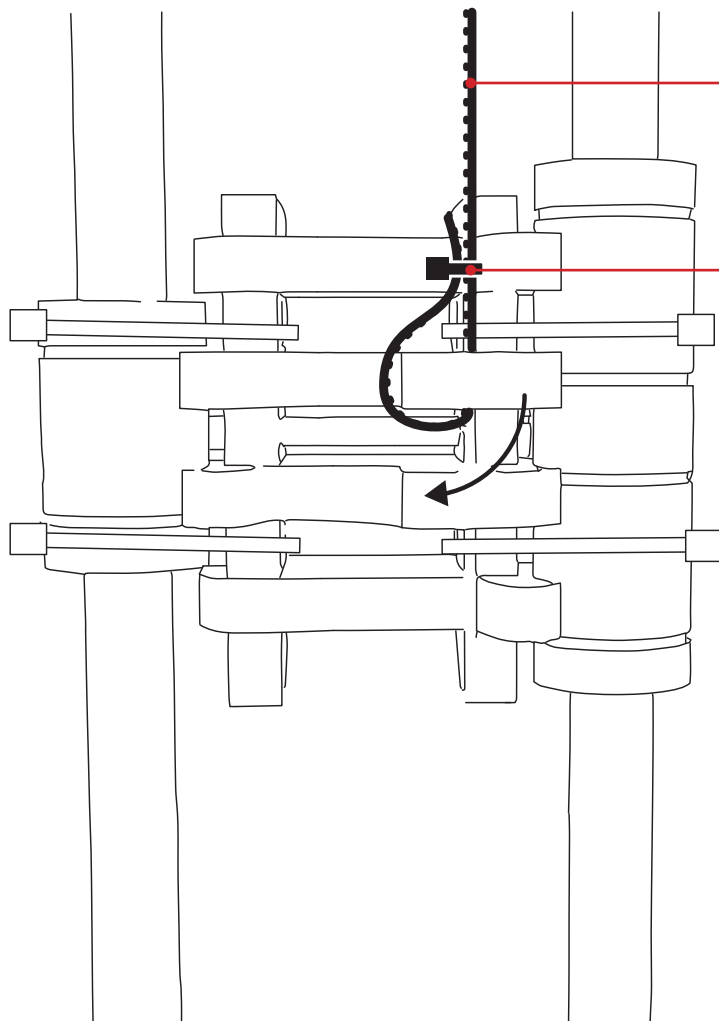
Distance between the bottom of the bottom frame and the top of the top frame

2



1

Teeth in the direction of the pulleys

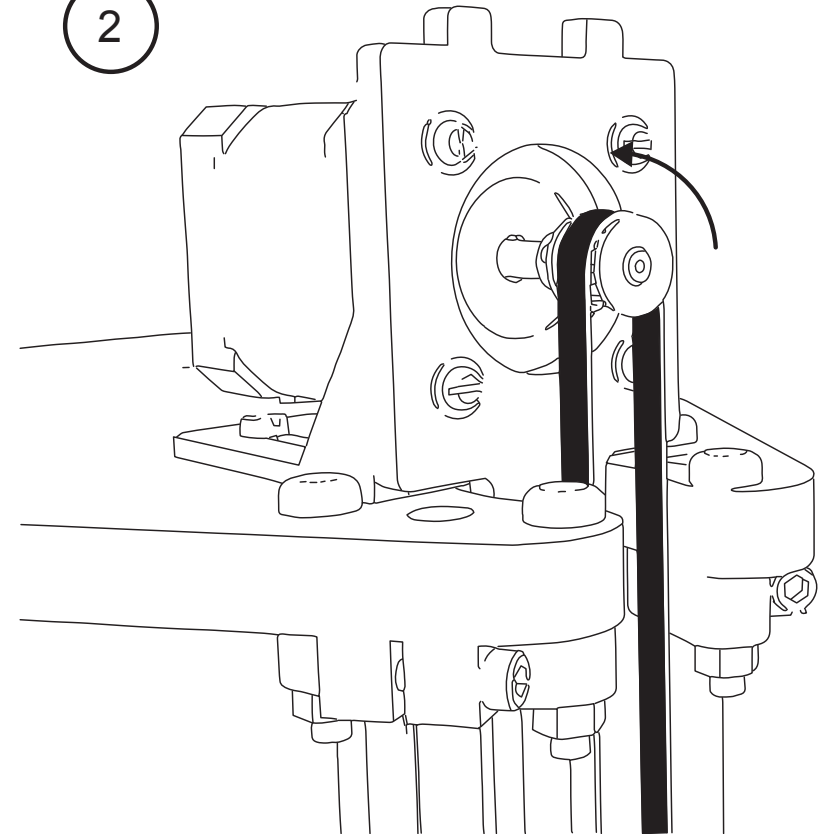


Belt

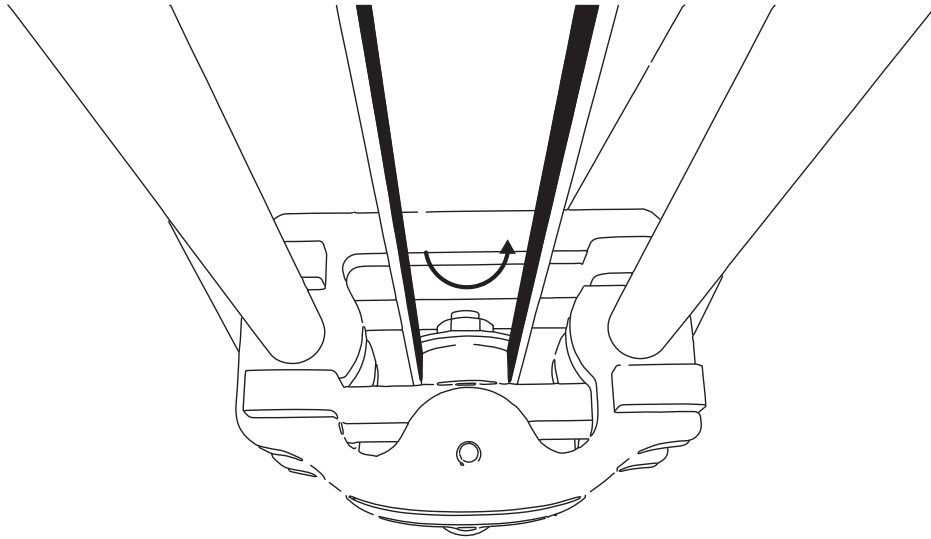
Zip tie

Position the zip tie as close as possible to the slider

2



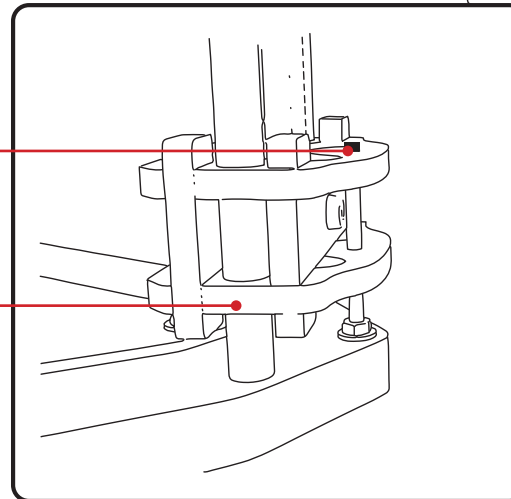
1



Make sure the belt is slightly tight when the tensioner is on the top of the screw

M3x50 Screw

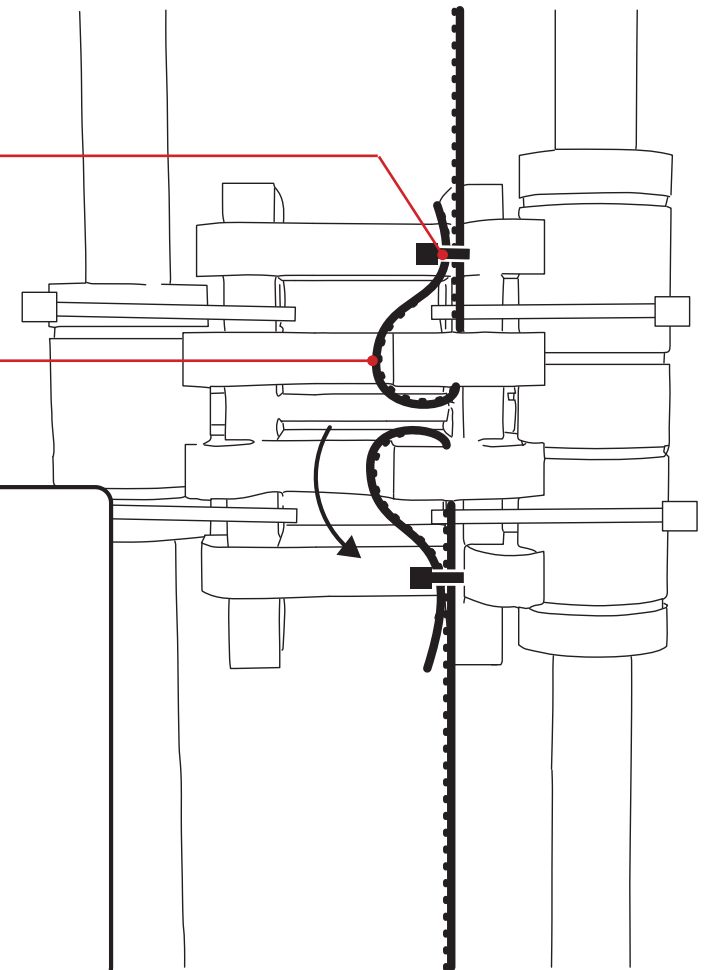
Tensioner

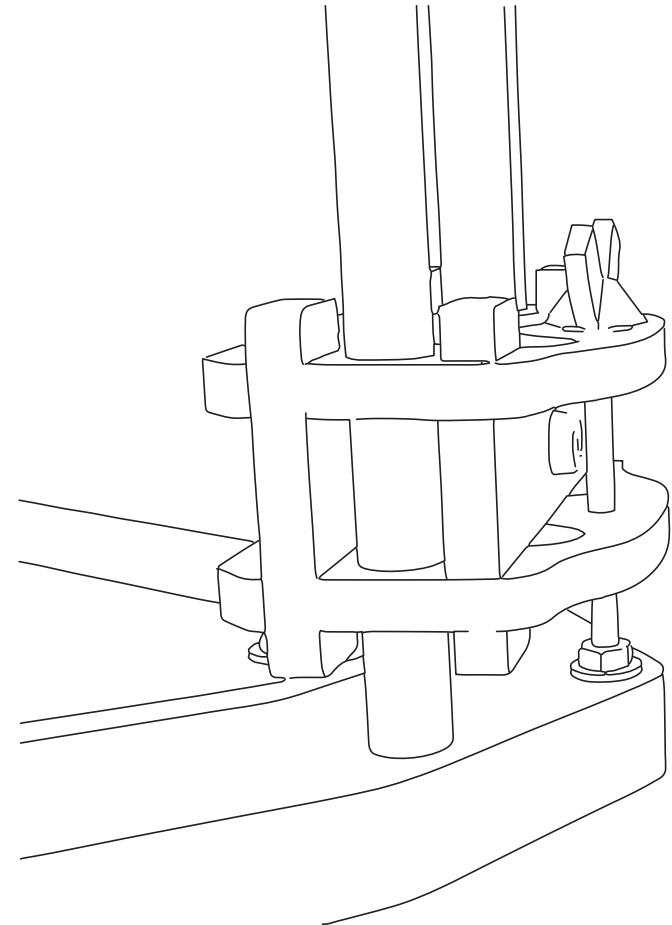
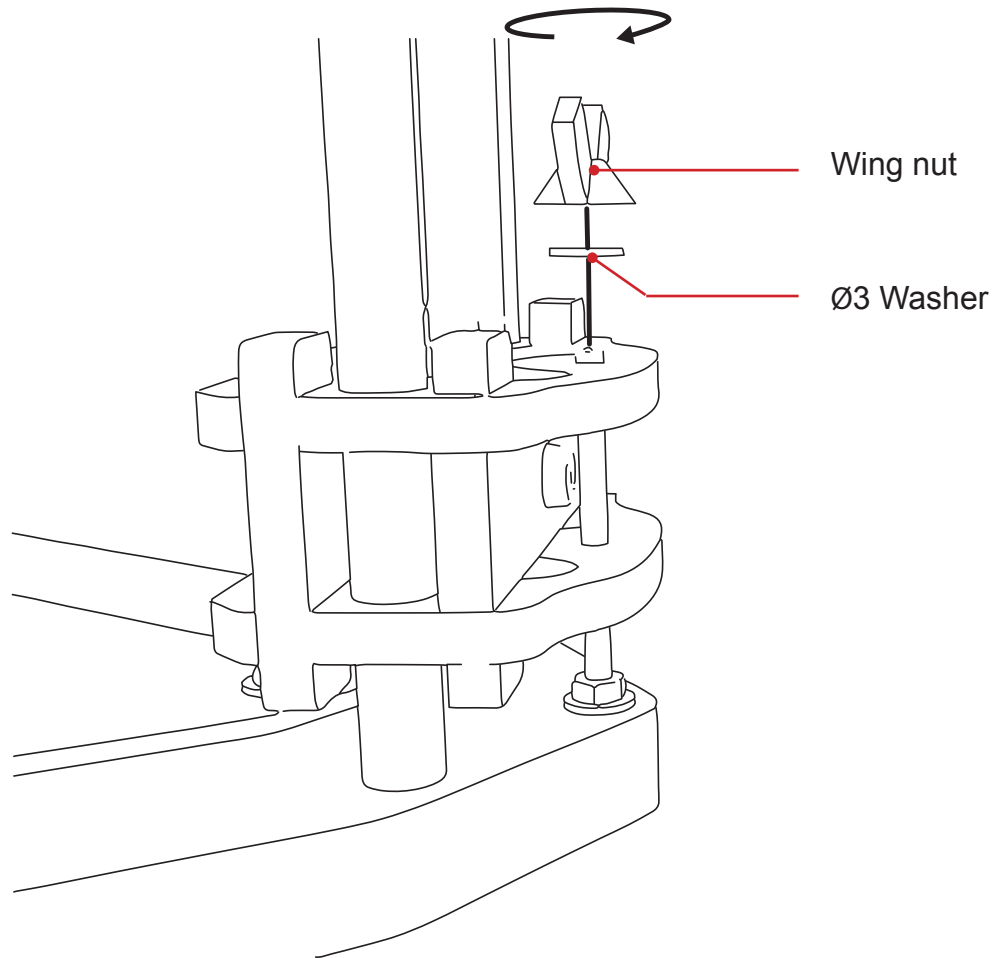


2

Zip tie

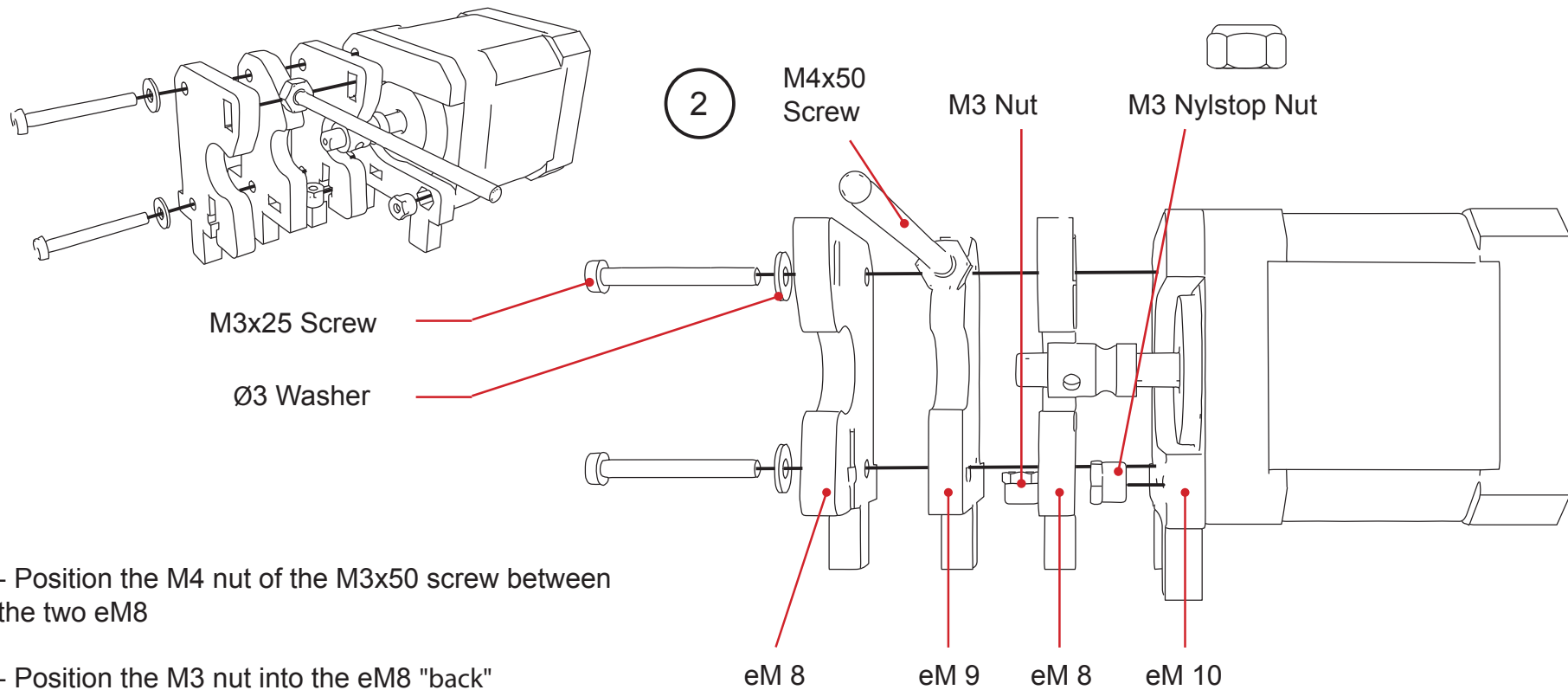
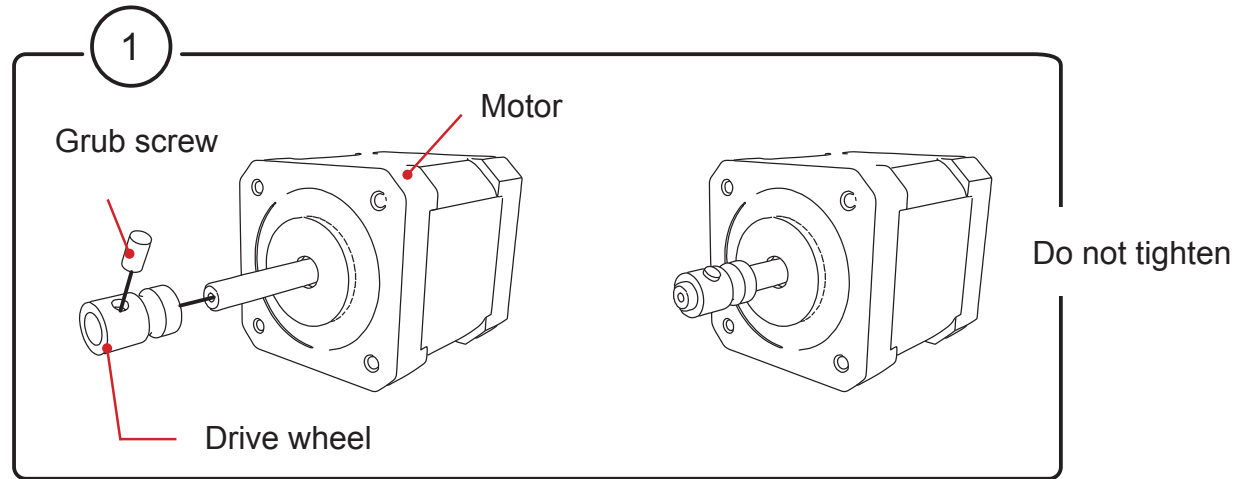
Belt





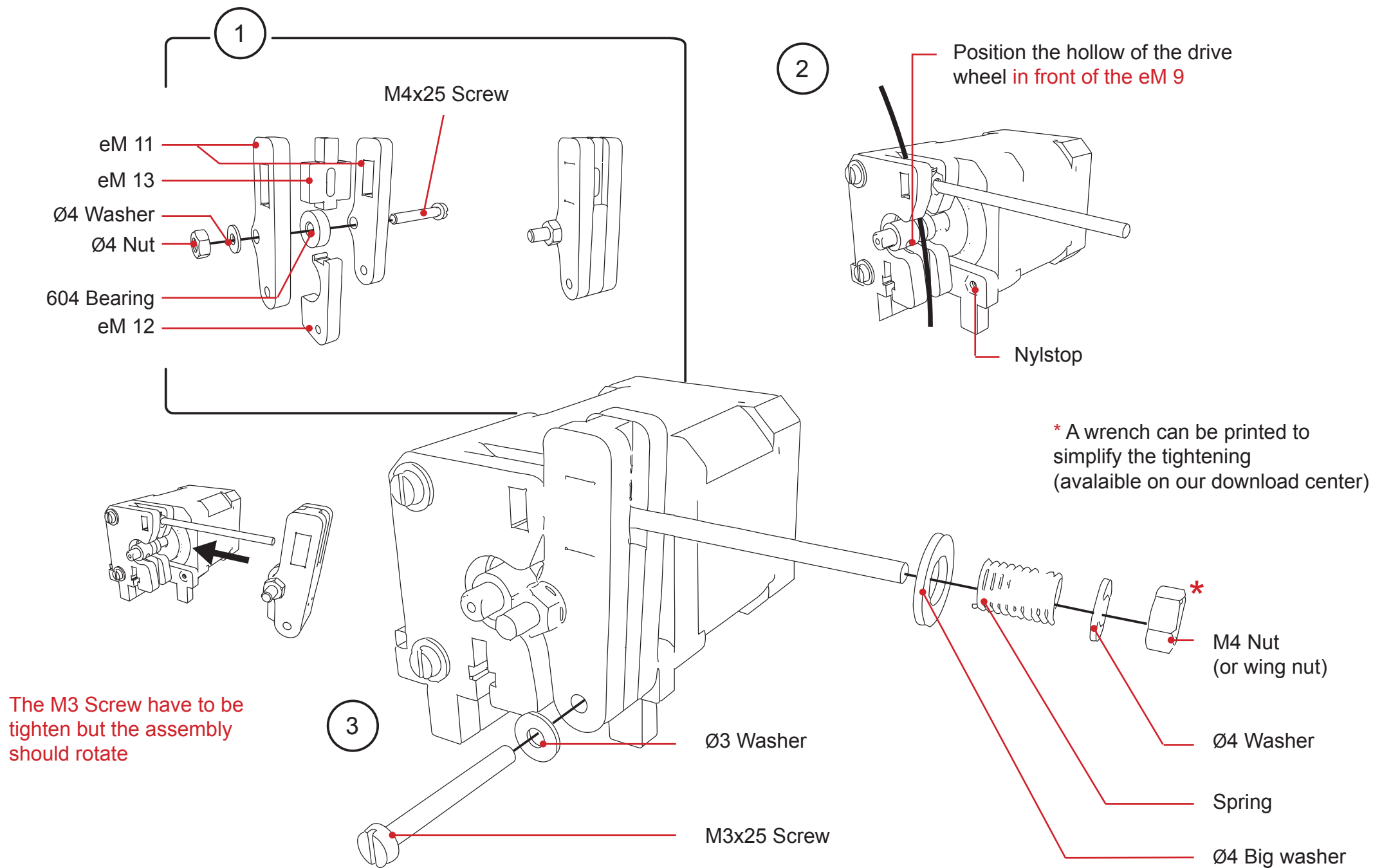
Thigten the nut to tight the belt

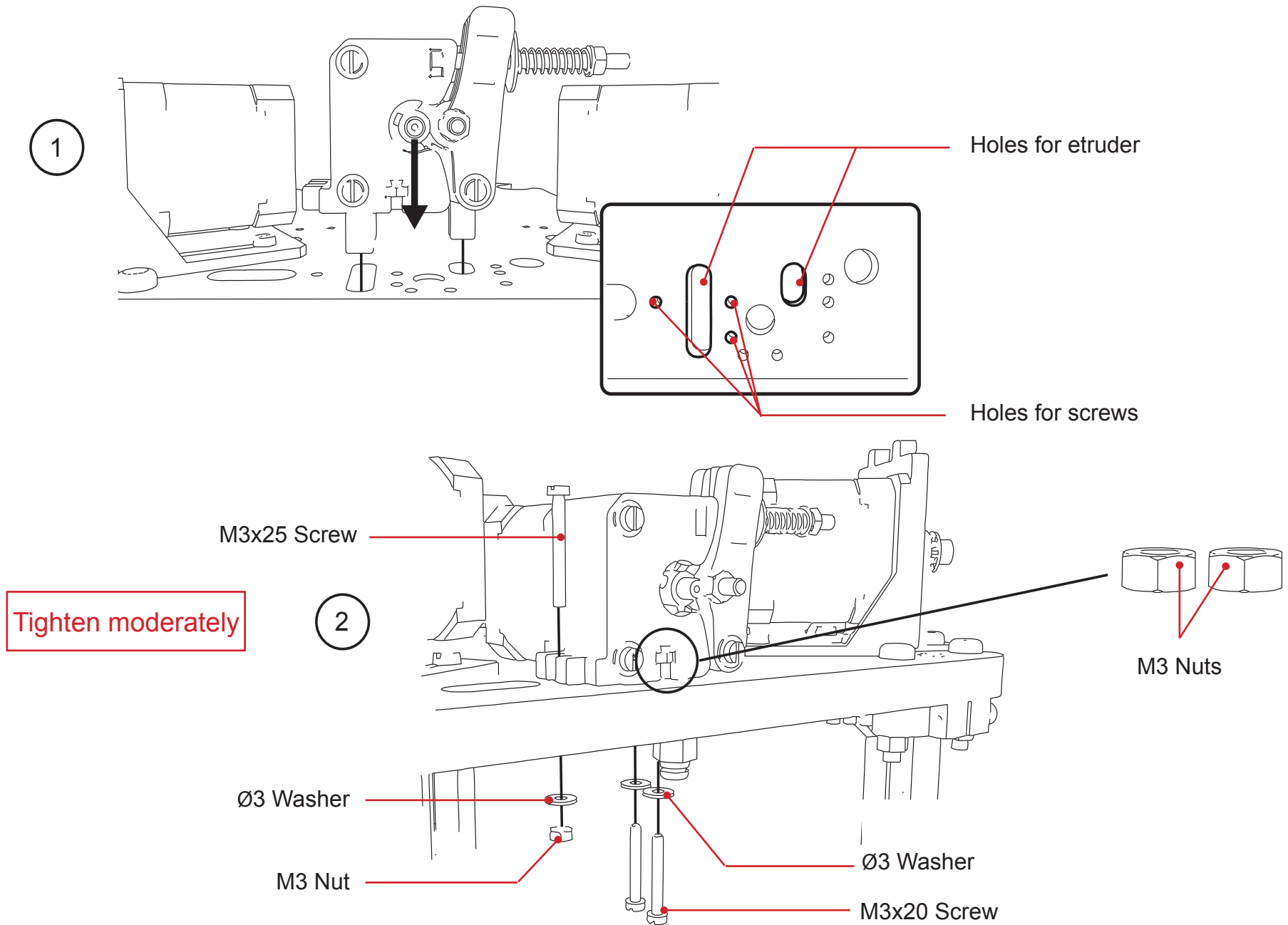
The belt don't have to be too tight to avoid deformation



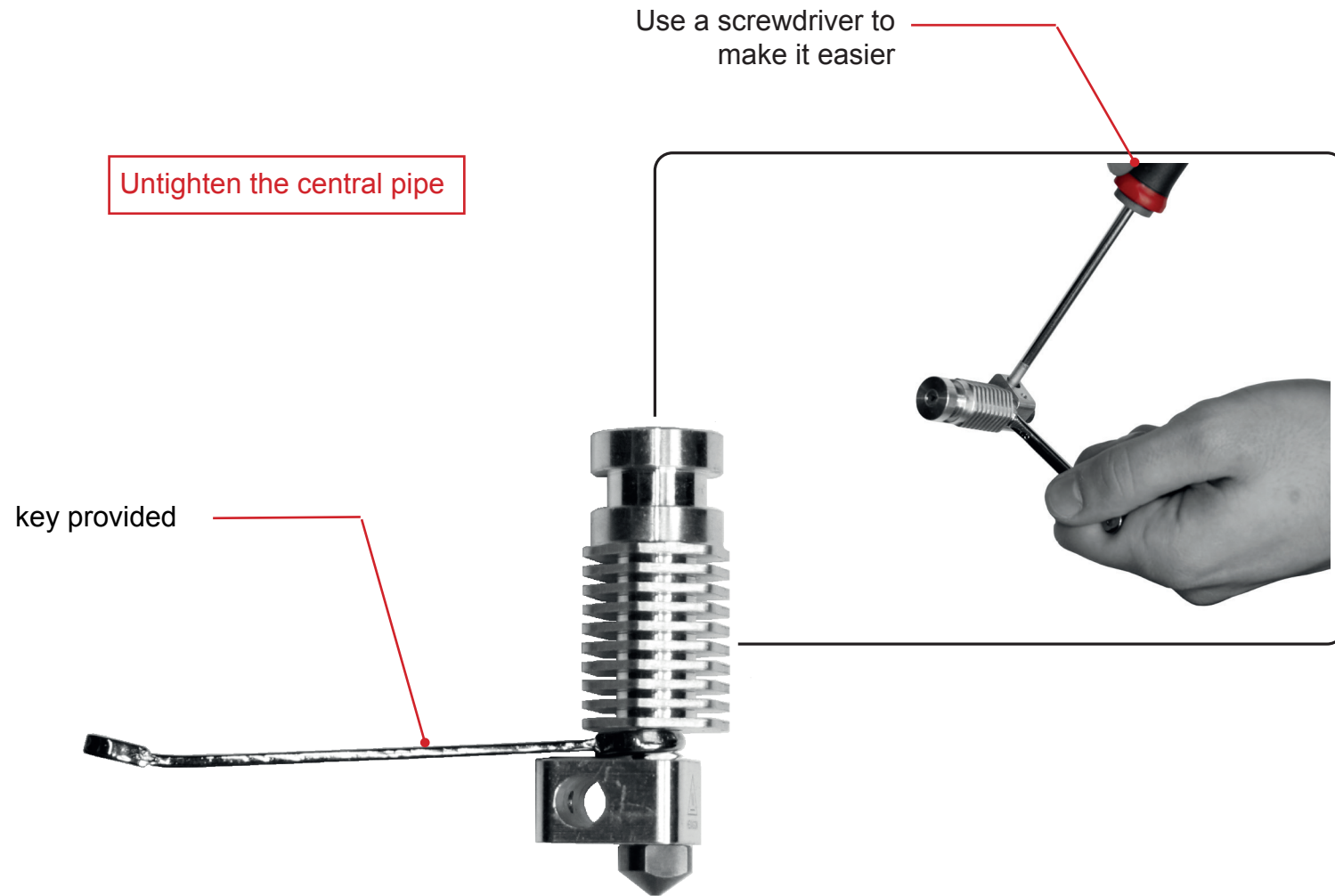
- Position the M4 nut of the M3x50 screw between the two eM8

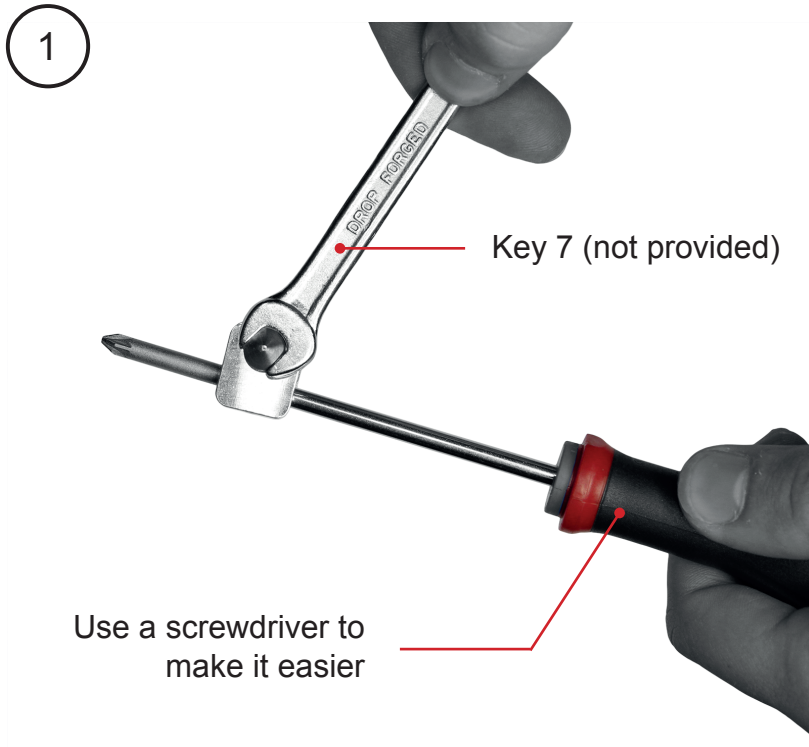
- Position the M3 nut into the eM8 "back"



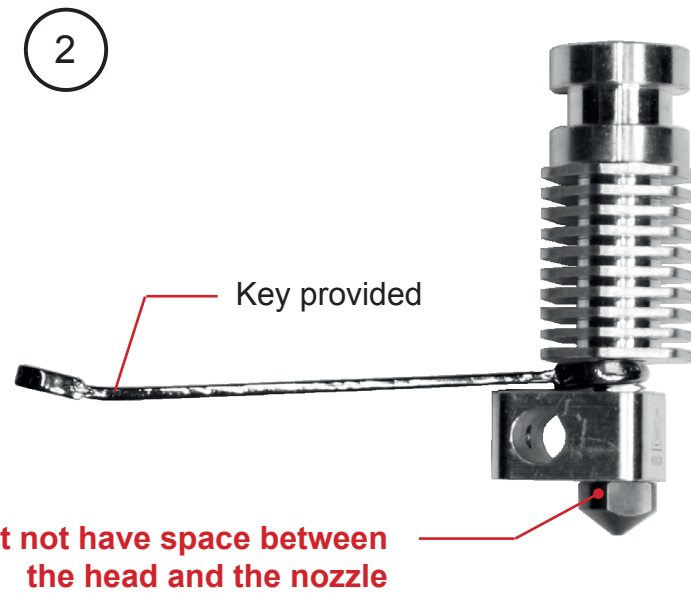




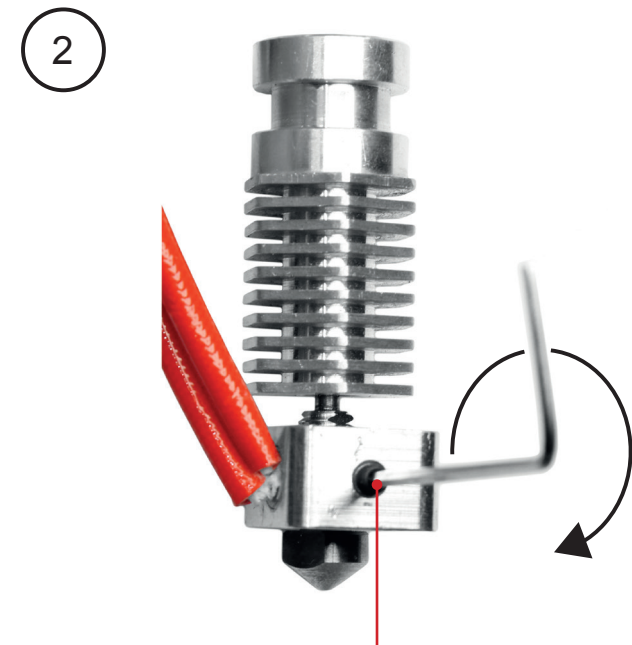
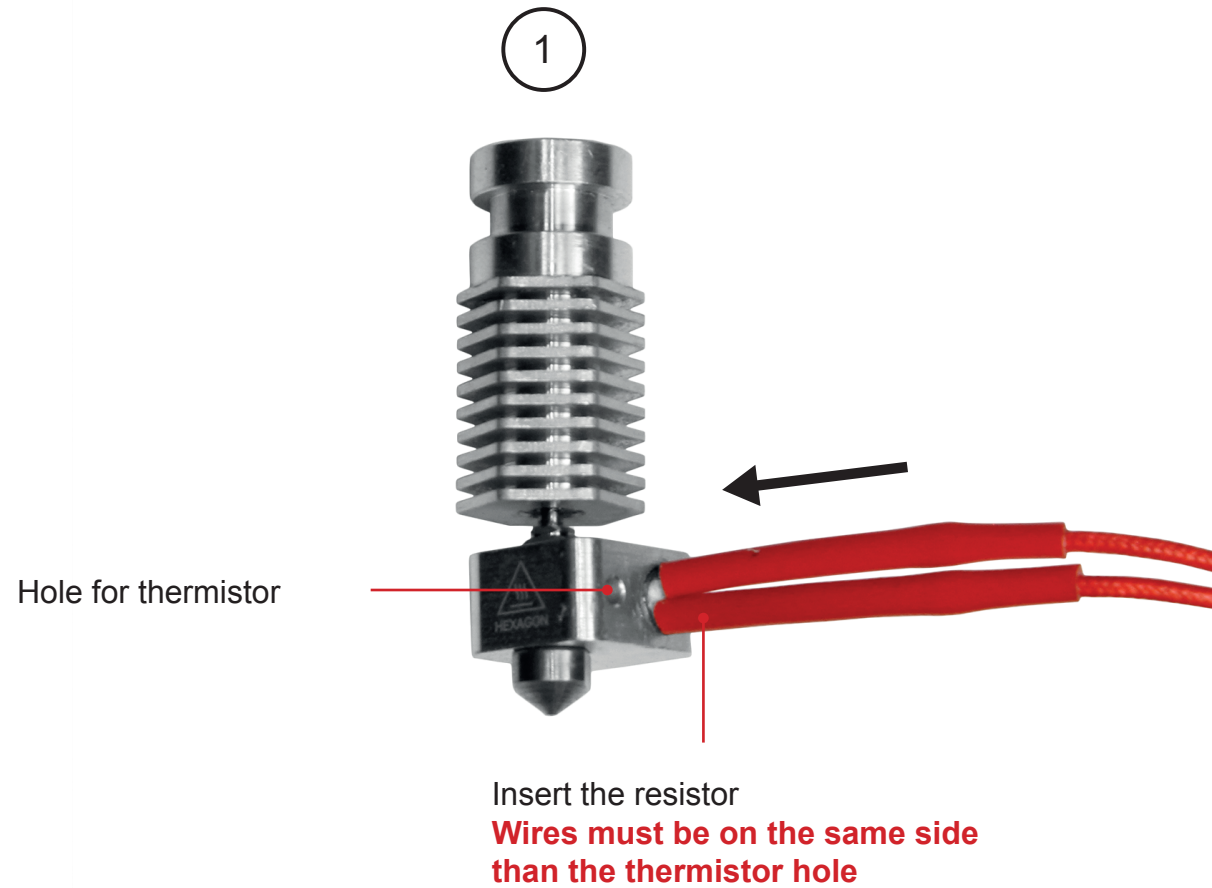




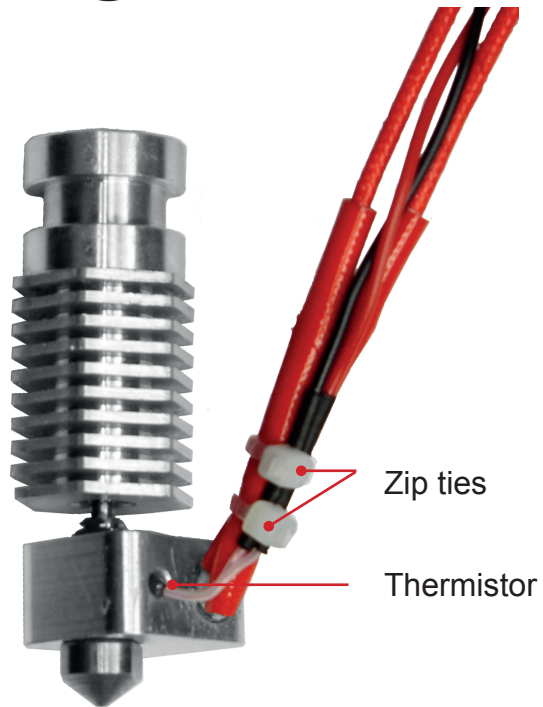
Tighten the nozzle



Tighten the central pipe

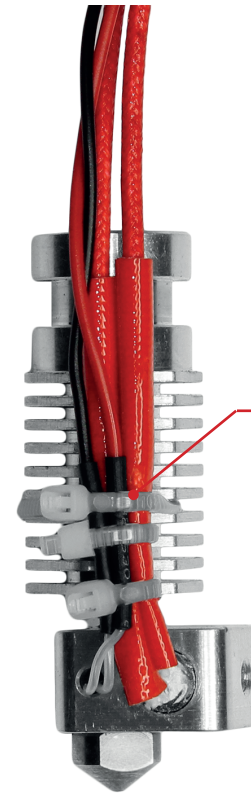


1



**Caution ! If the thermistor goes out of the hot end, your printer could be damaged.**

2



Fasten the cables to the hot end with zip tie.

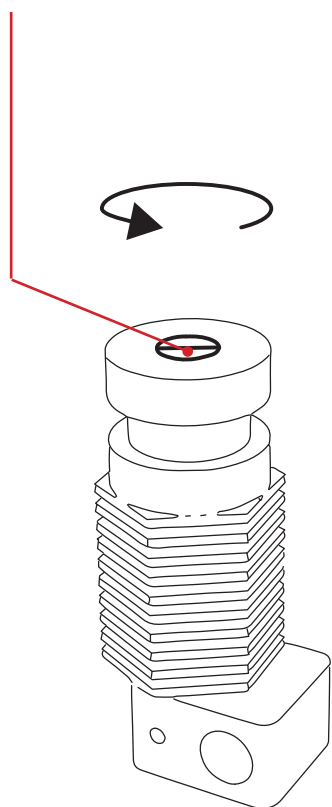
The zip tie must be positioned **around** the Hexagon

**Don't position it to high on the hexagon**

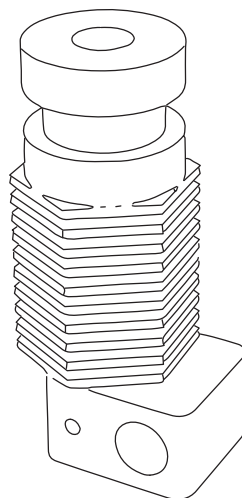
Polyimide can be used to maintain the thermistor (optional)

\* For printing ABS with heated bed option, protect you're heater block with polyimide

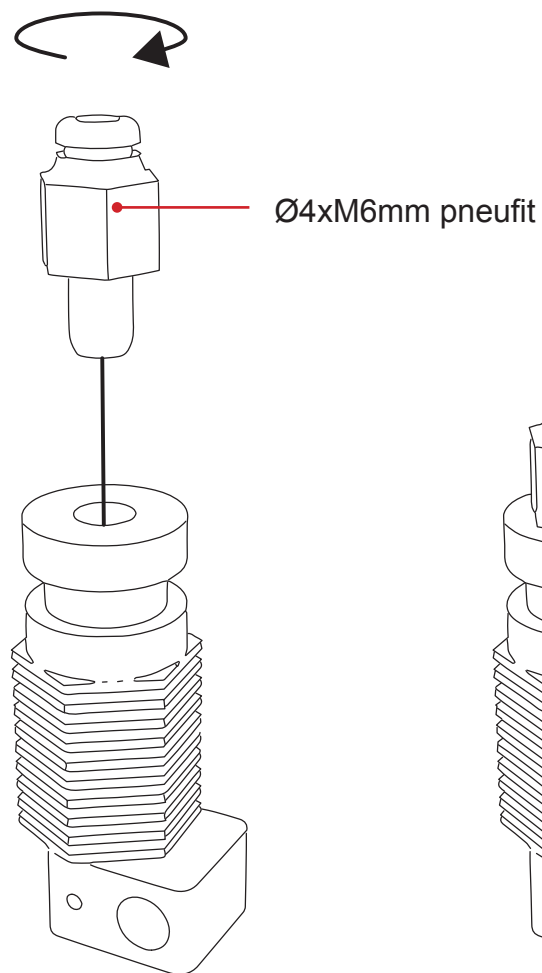
Unscrew the filament guide



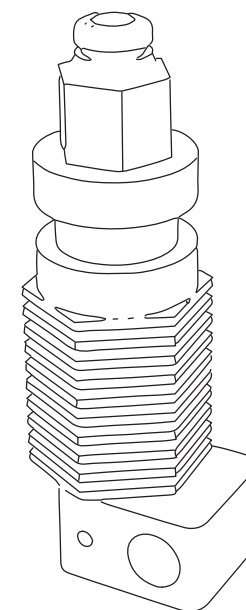
1



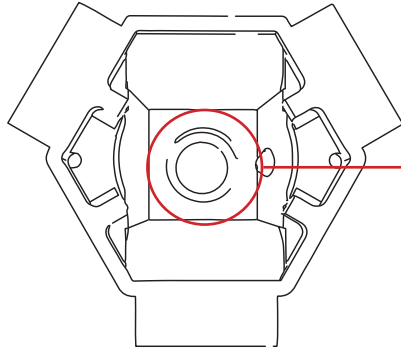
2



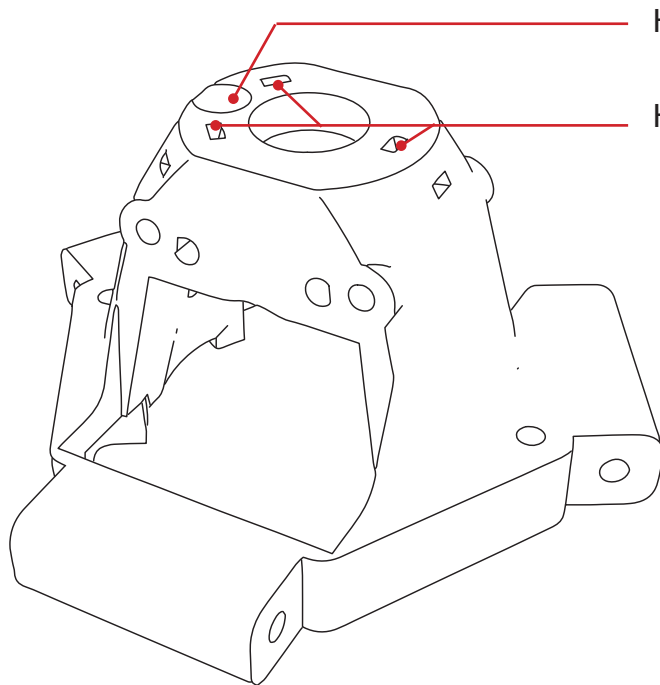
3



4

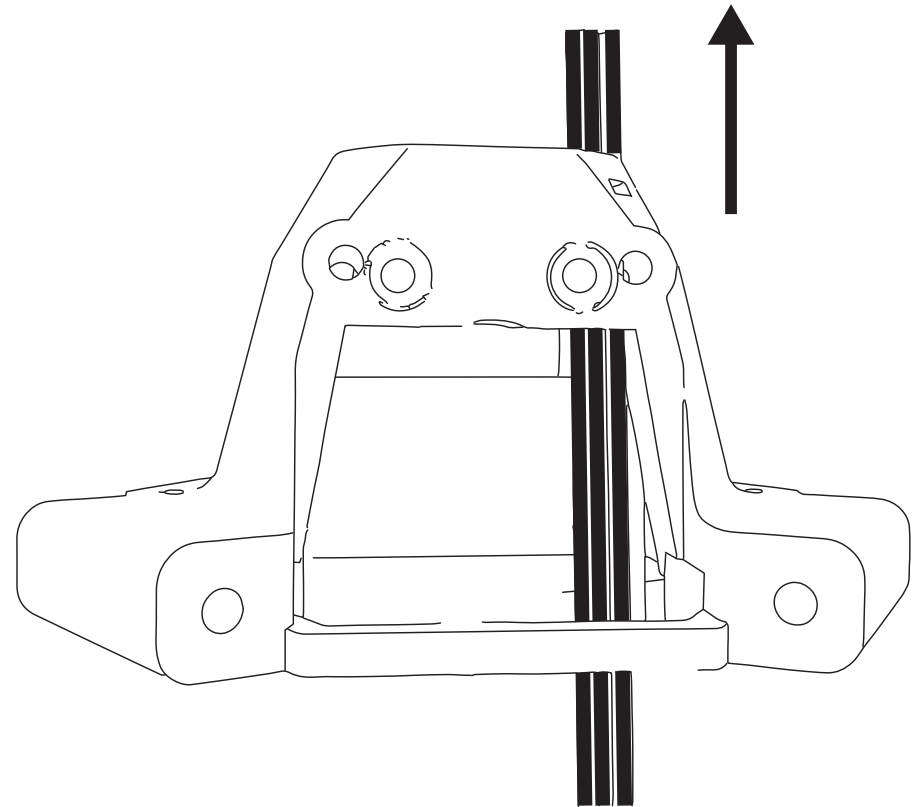


Make sure the core is free of impurities.



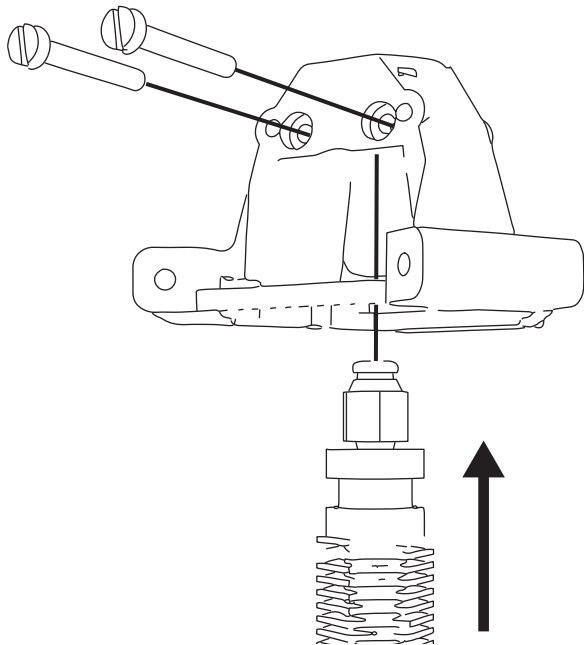
Hole for wires

Hole for Zip tie



Put the cables through the wire hole.

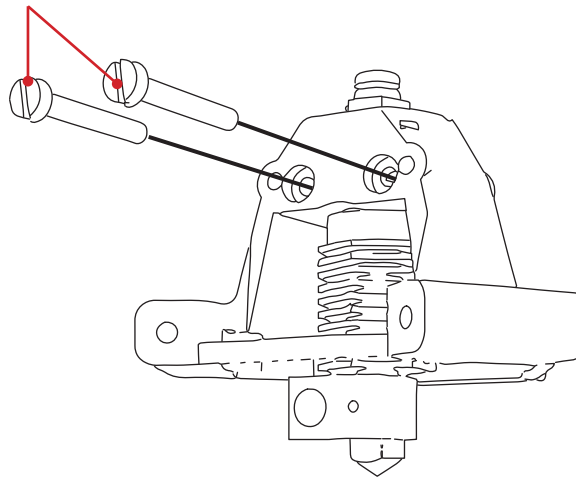
1



Position the Hexagon against the  
core **before screwing**

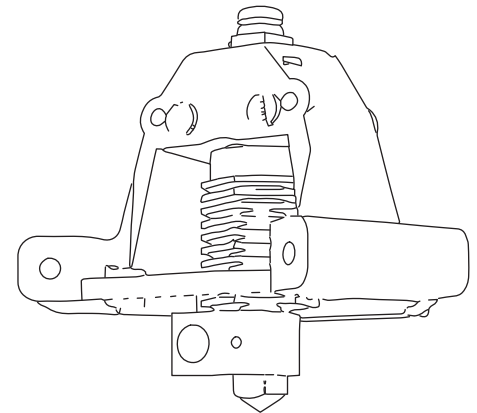
2

M3x20 screw

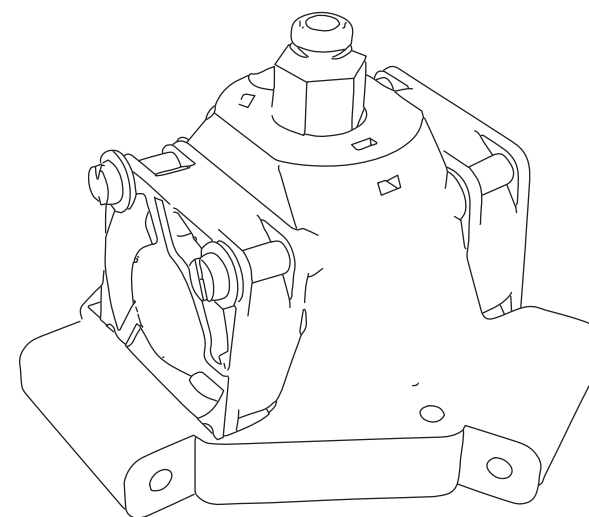
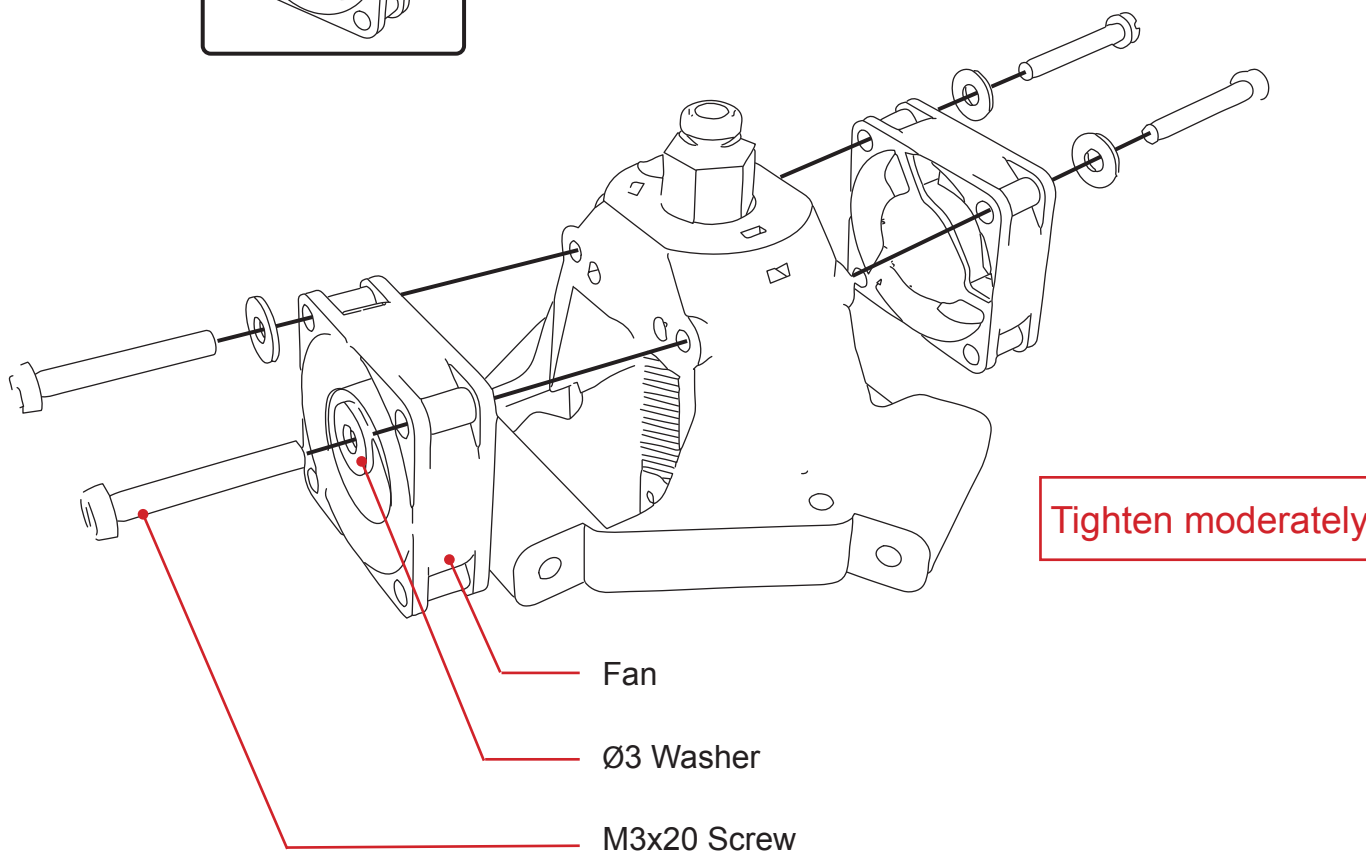
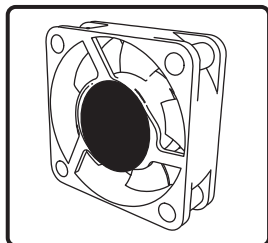


**Tighten**

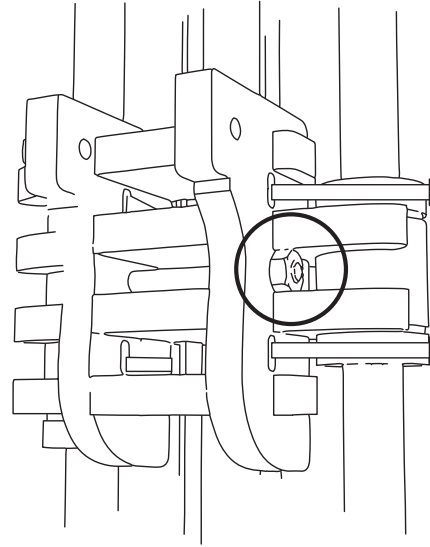
3



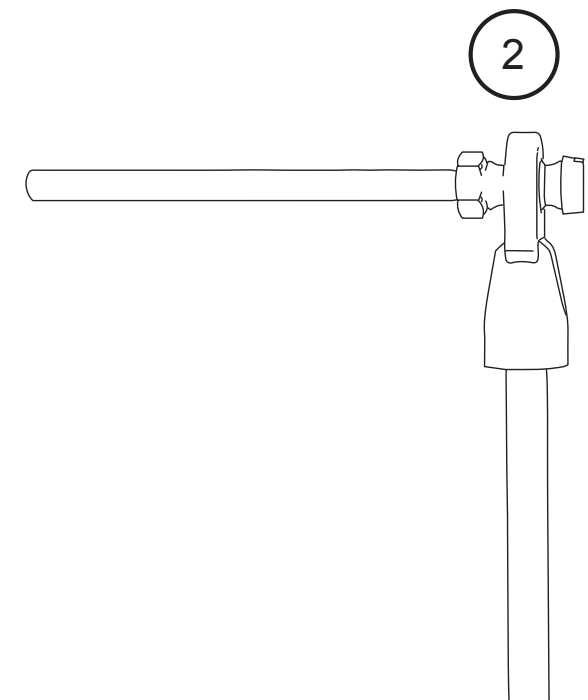
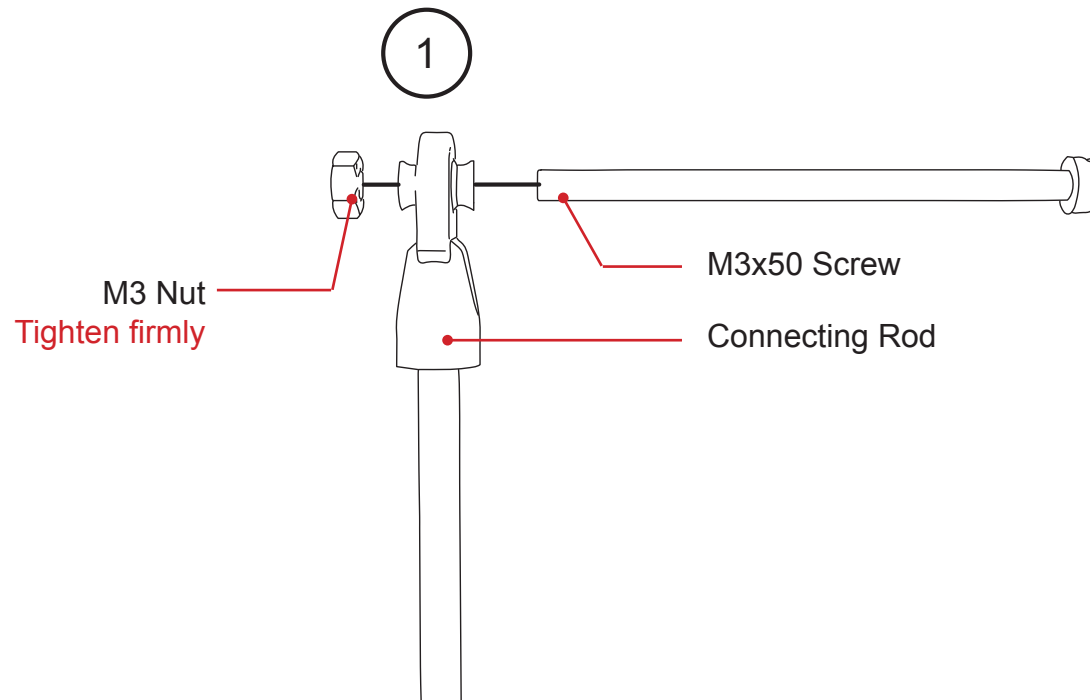
The side with the **sticker** must be oriented **toward the hotend**

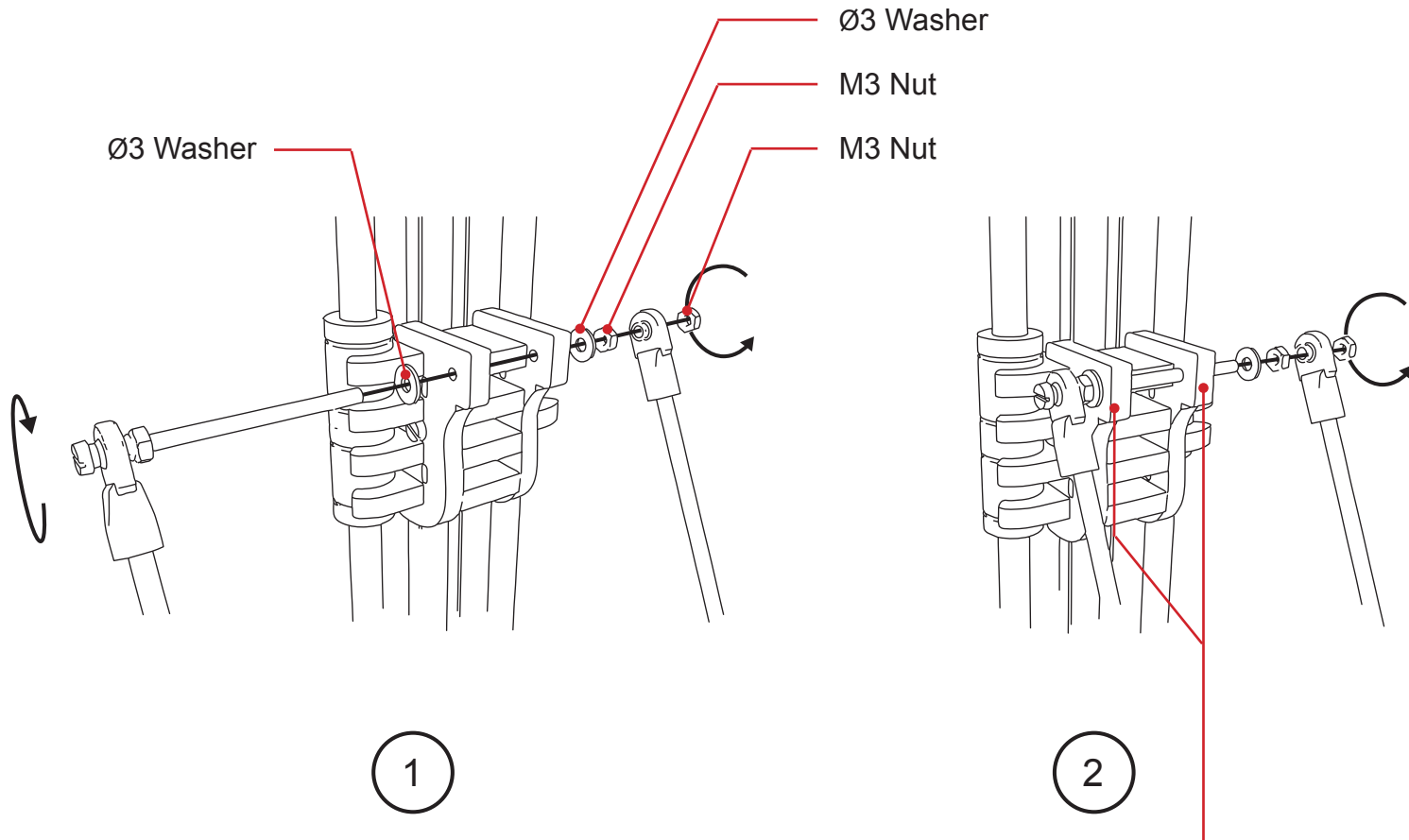




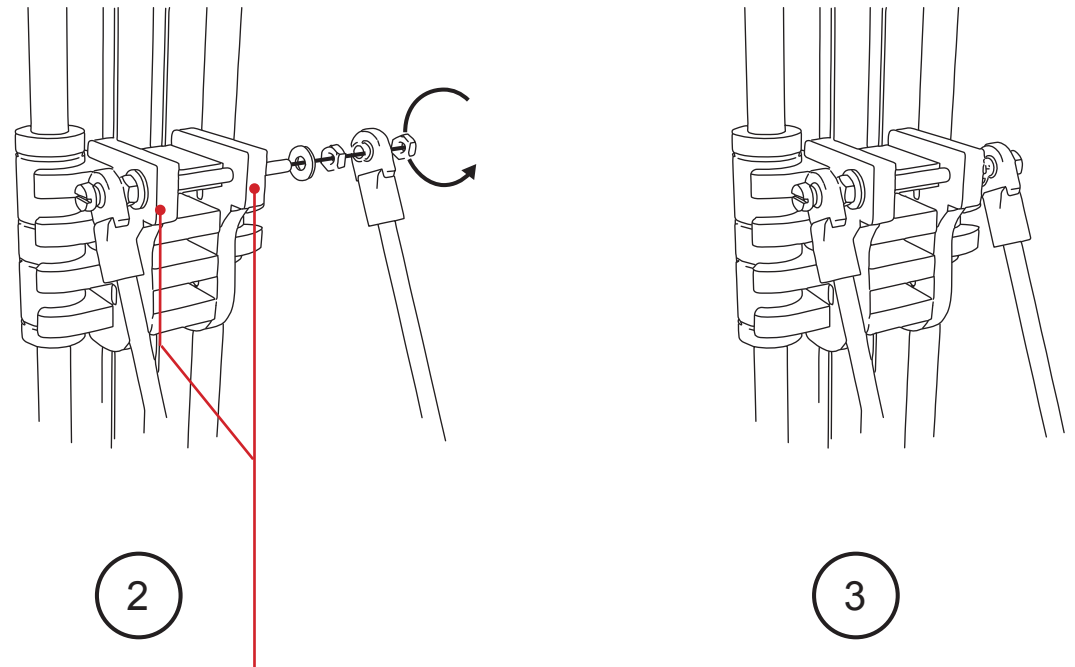


**Note :** Check this nut is tighten



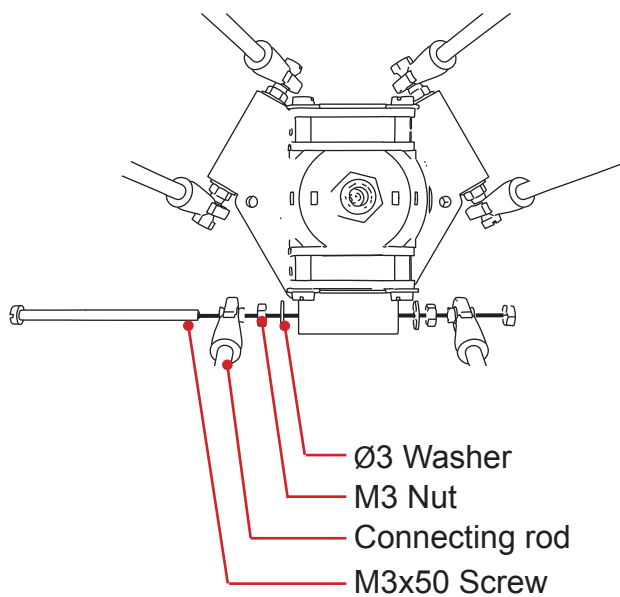


**Caution :** The assembly must not twist the slider.

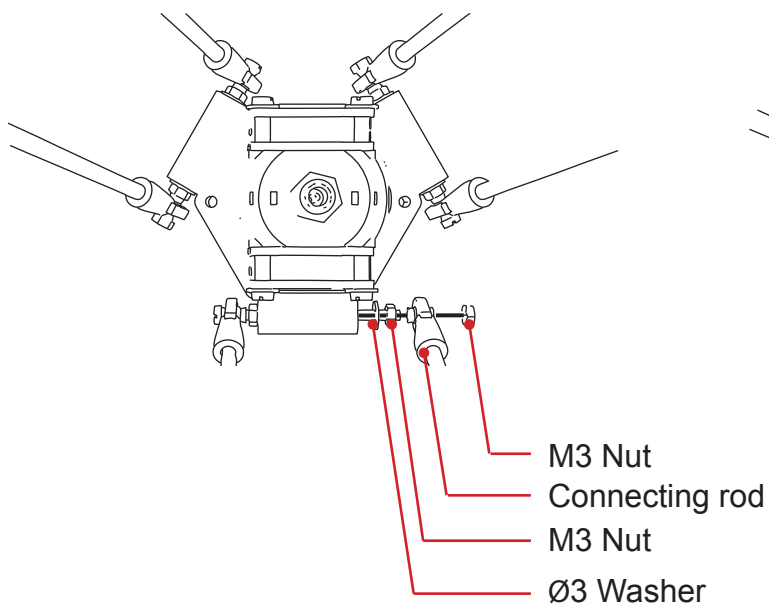


eM 5 must remain parallel

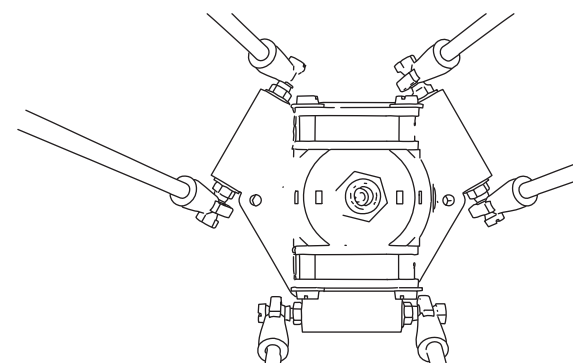
1



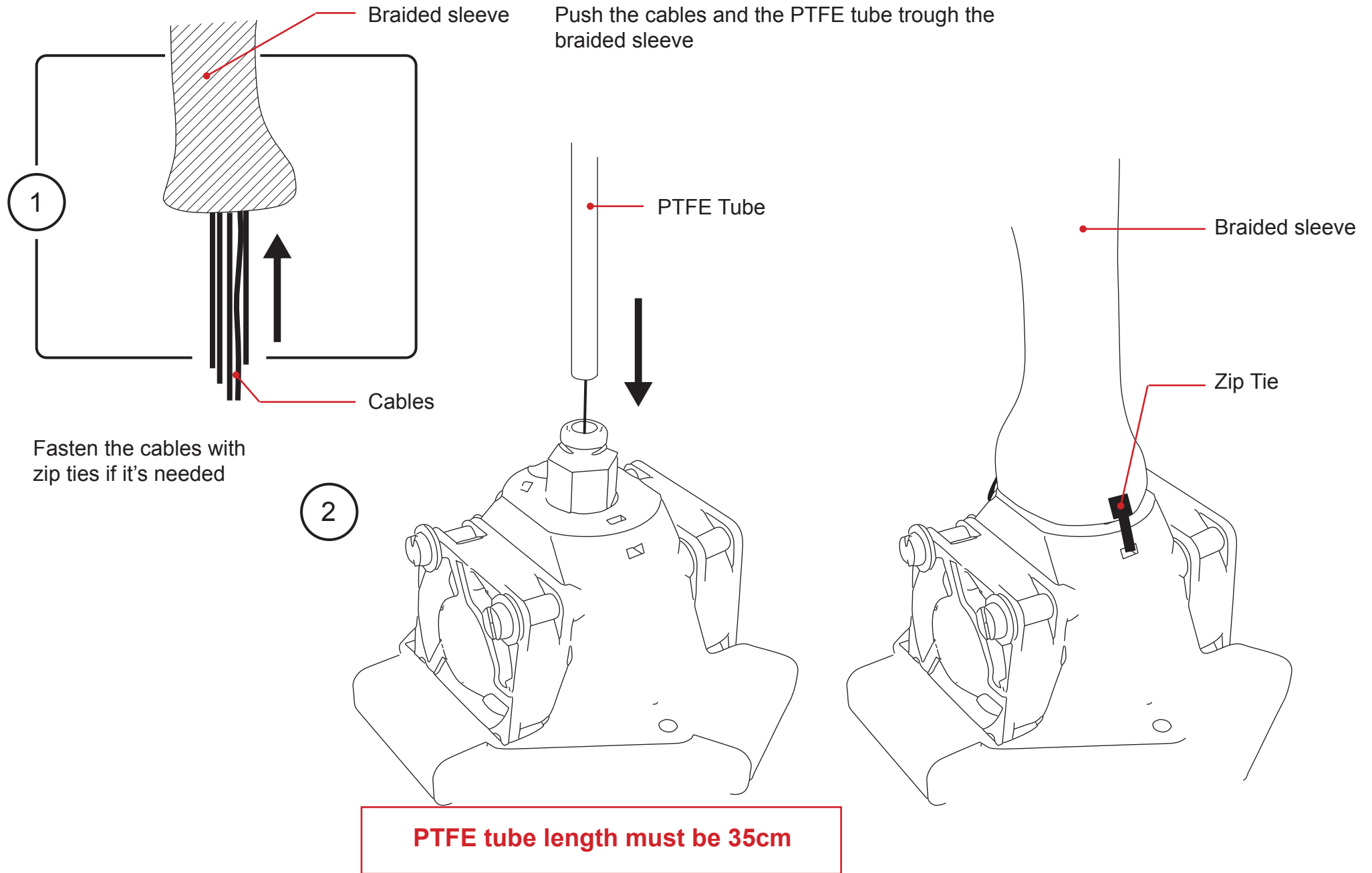
2



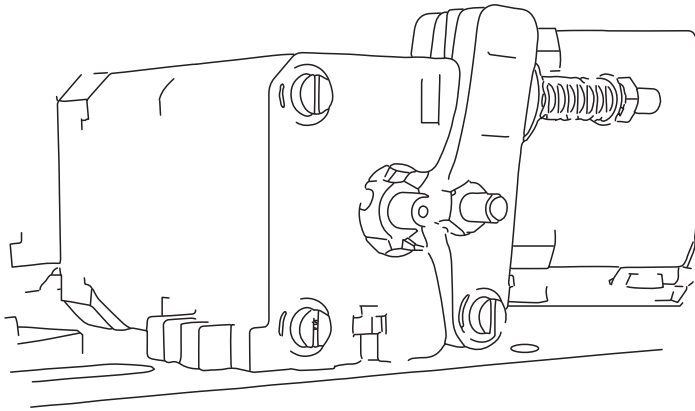
3



Repeat the operation with the others sides

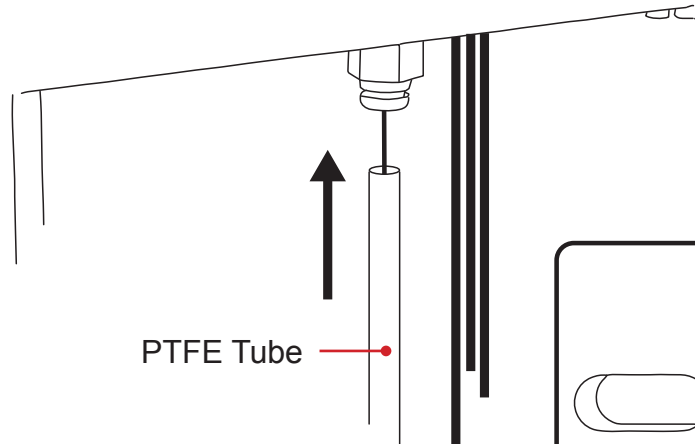
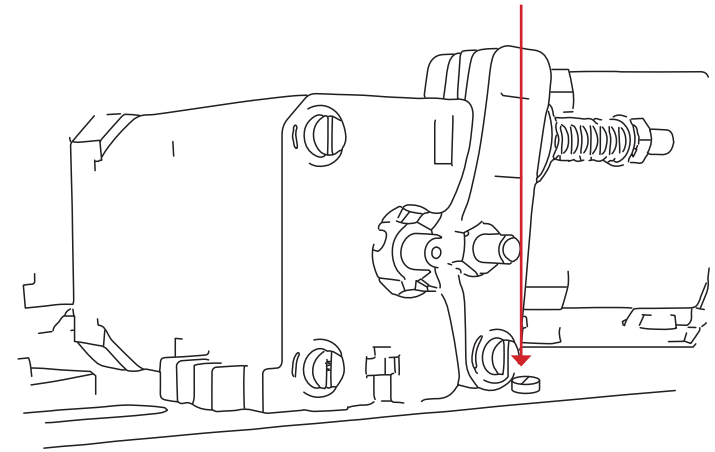


1

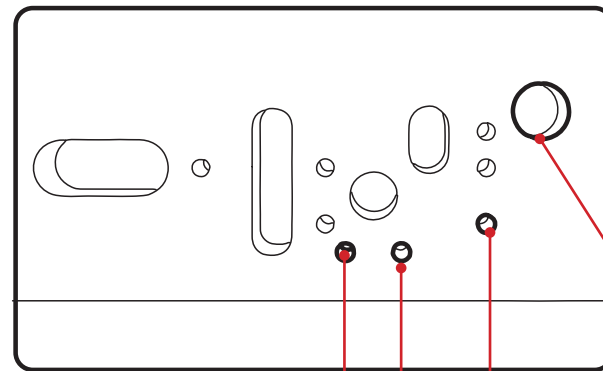


2

Screw is tighten with a  
Ø3 washer and M3 Nut  
to the plate



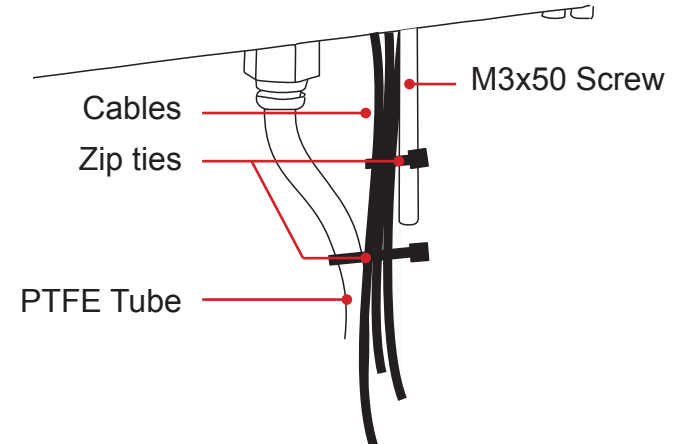
PTFE Tube



Hole for cables

Holes for Zip ties

Holes for M3x50  
Screws

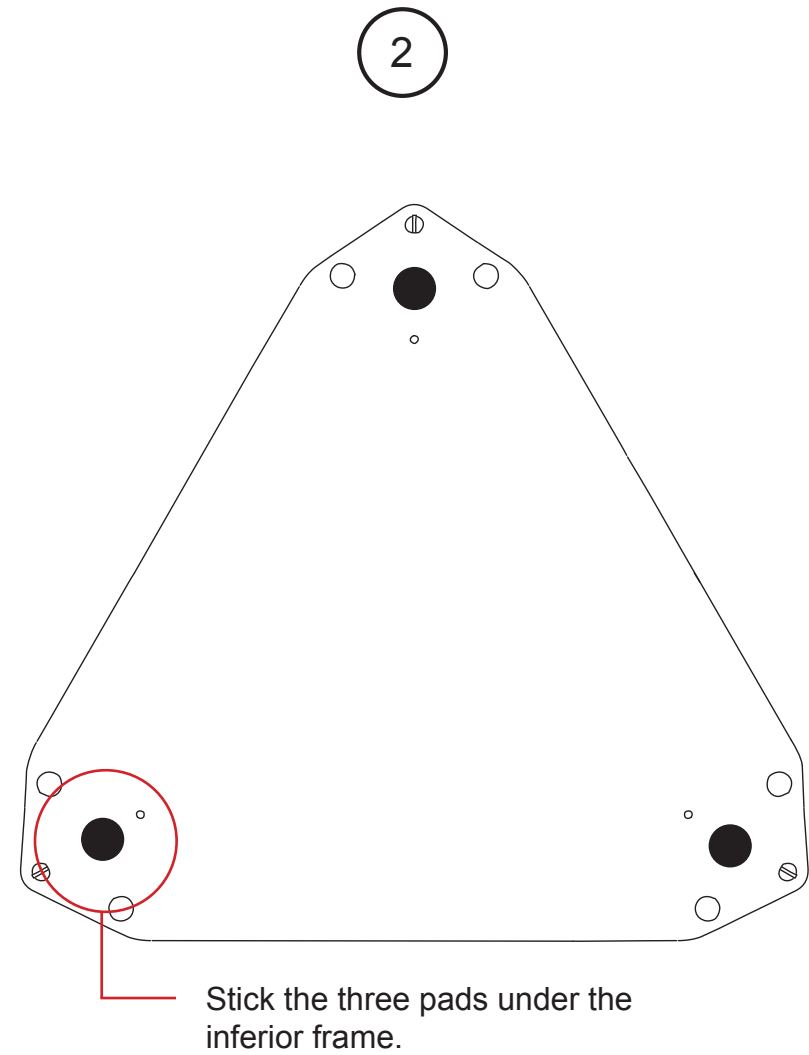
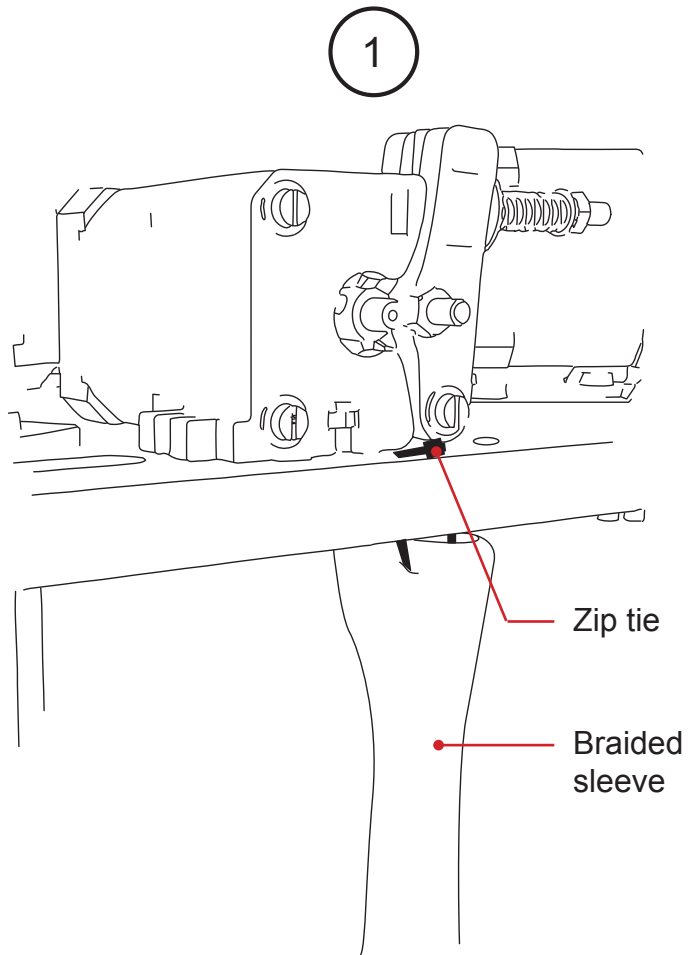


Cables

Zip ties

PTFE Tube

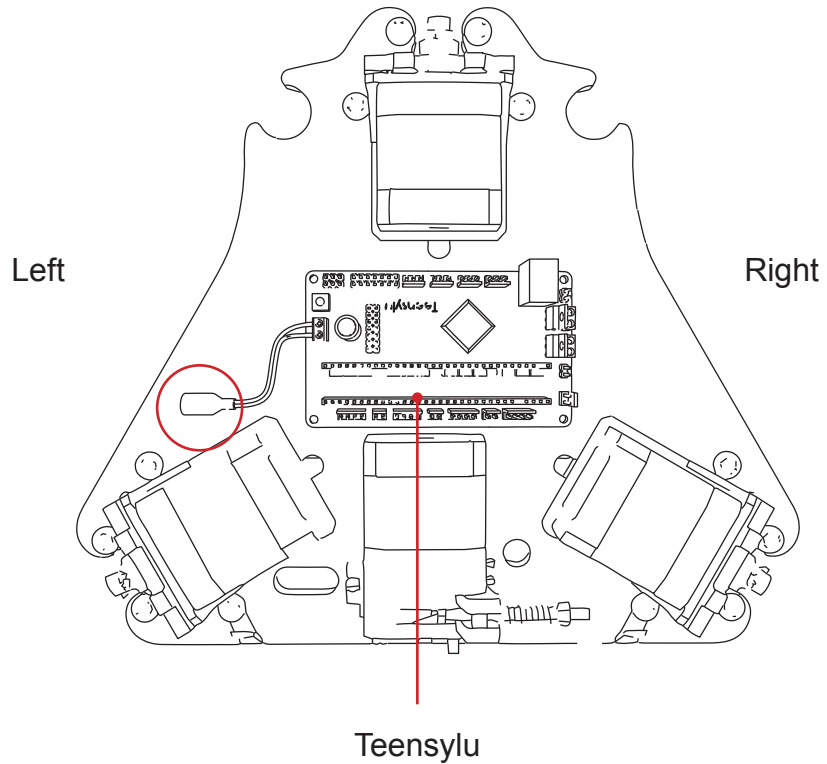
M3x50 Screw



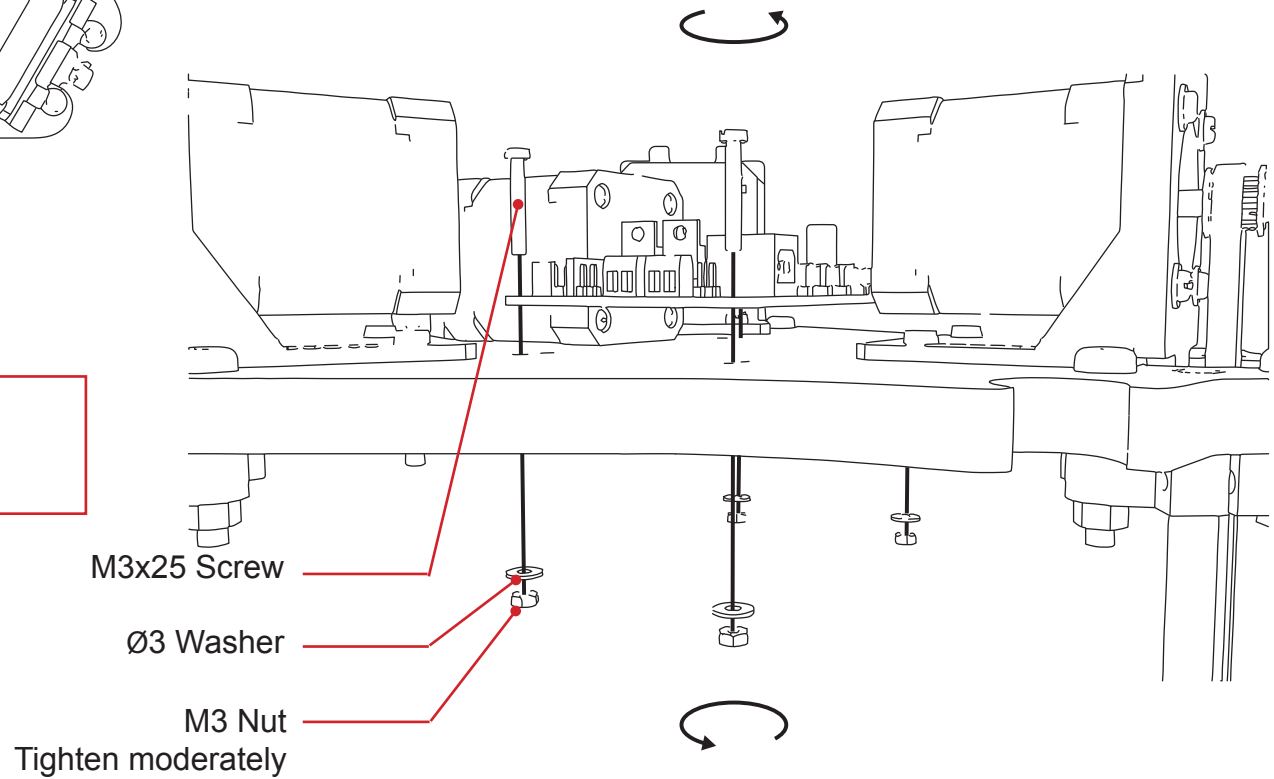
---

# ELECTRONIC ASSEMBLY

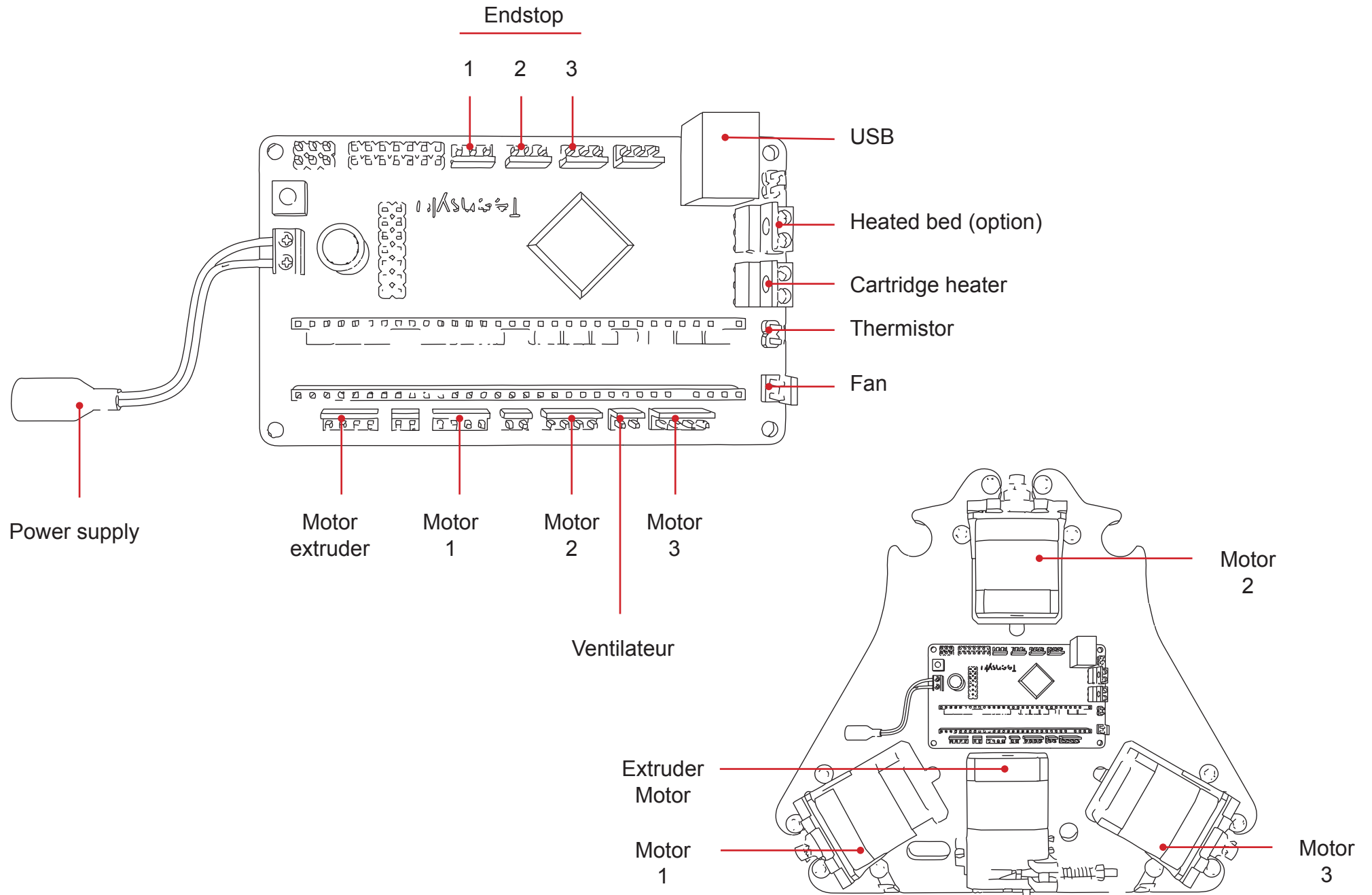
---

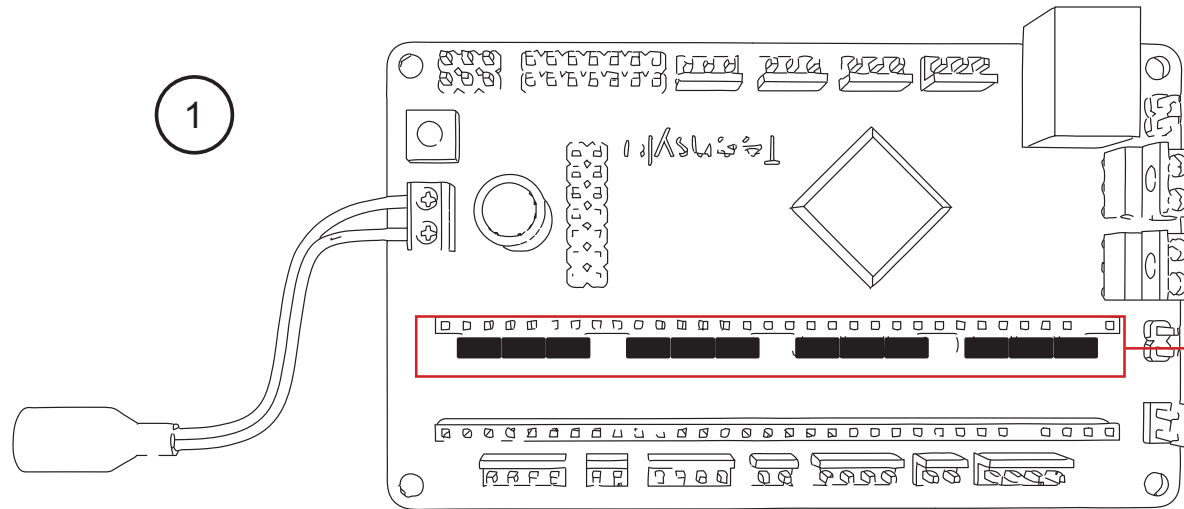


Pay attention to the teensylu orientation

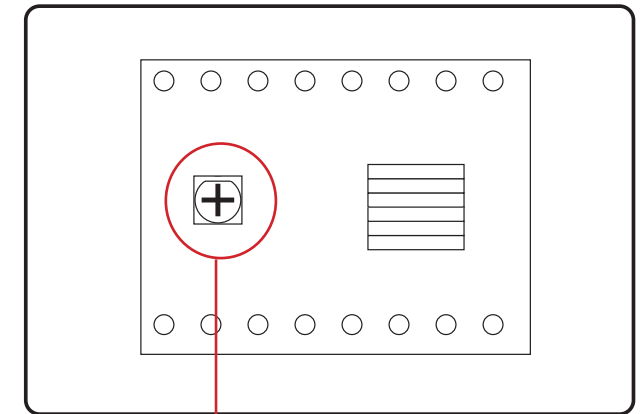
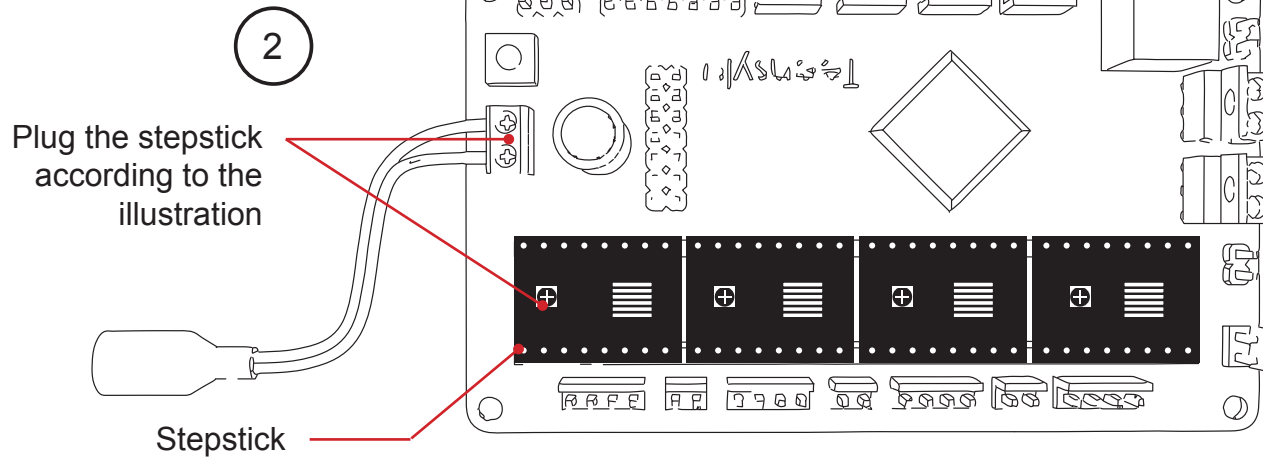






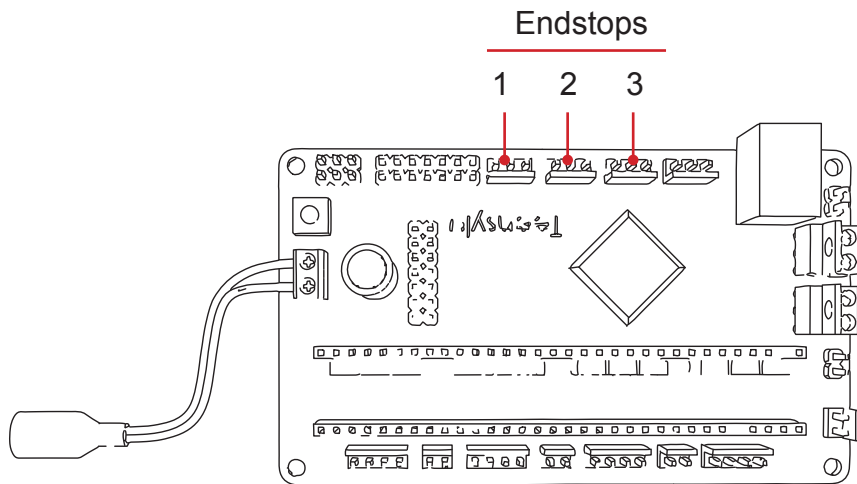


Make sure that you have 12 jumpers connected to the teensylu

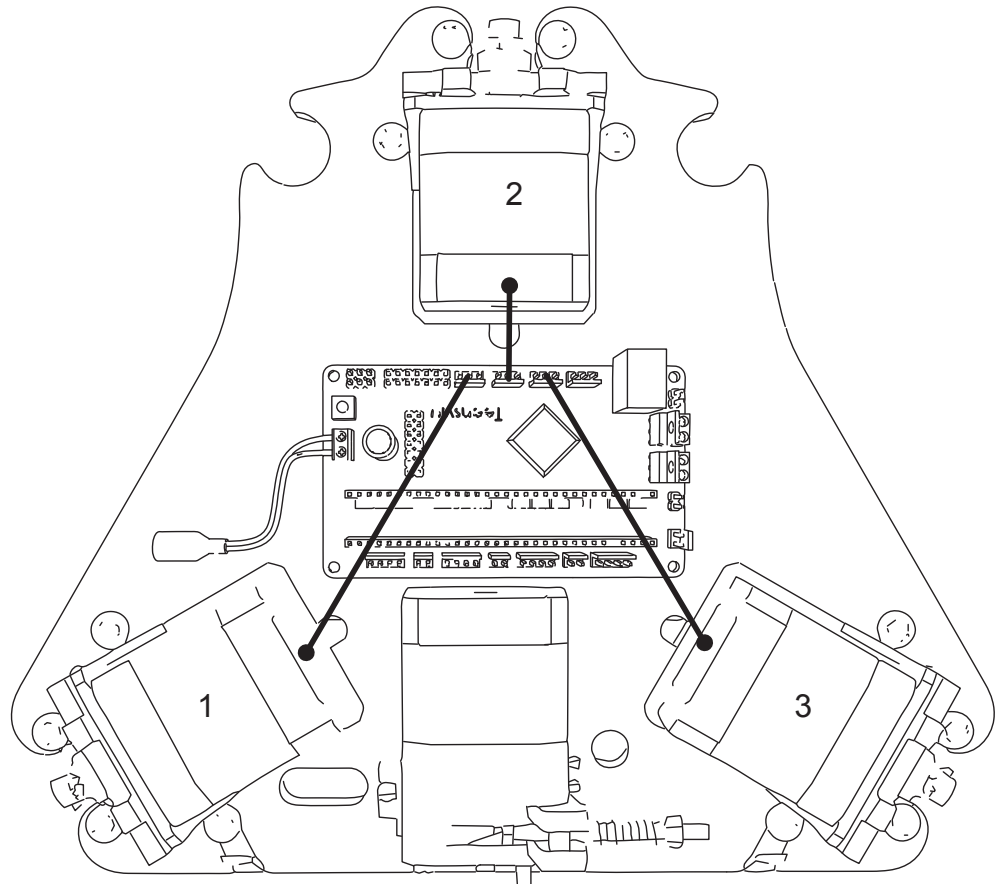


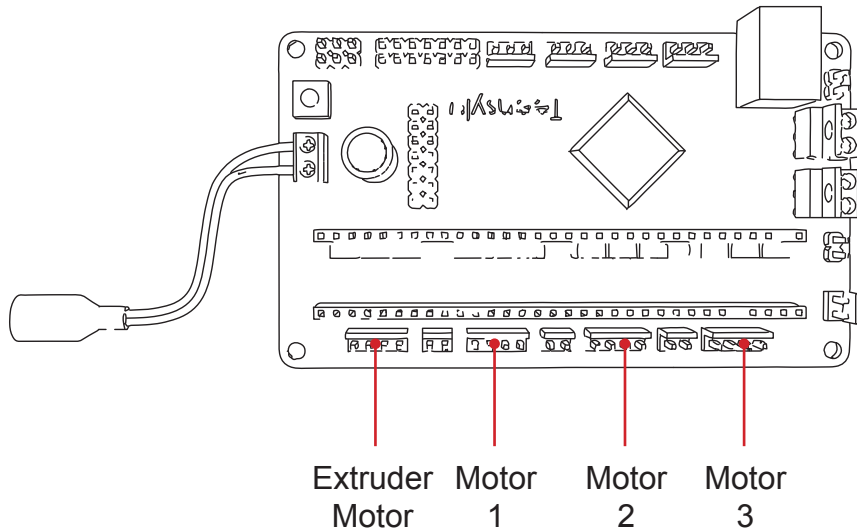
Make sure the flat is positioned as shown the image

**Be careful: The orientation is very important!**  
(A wrong connection of the stepstick could cause permanent damage)

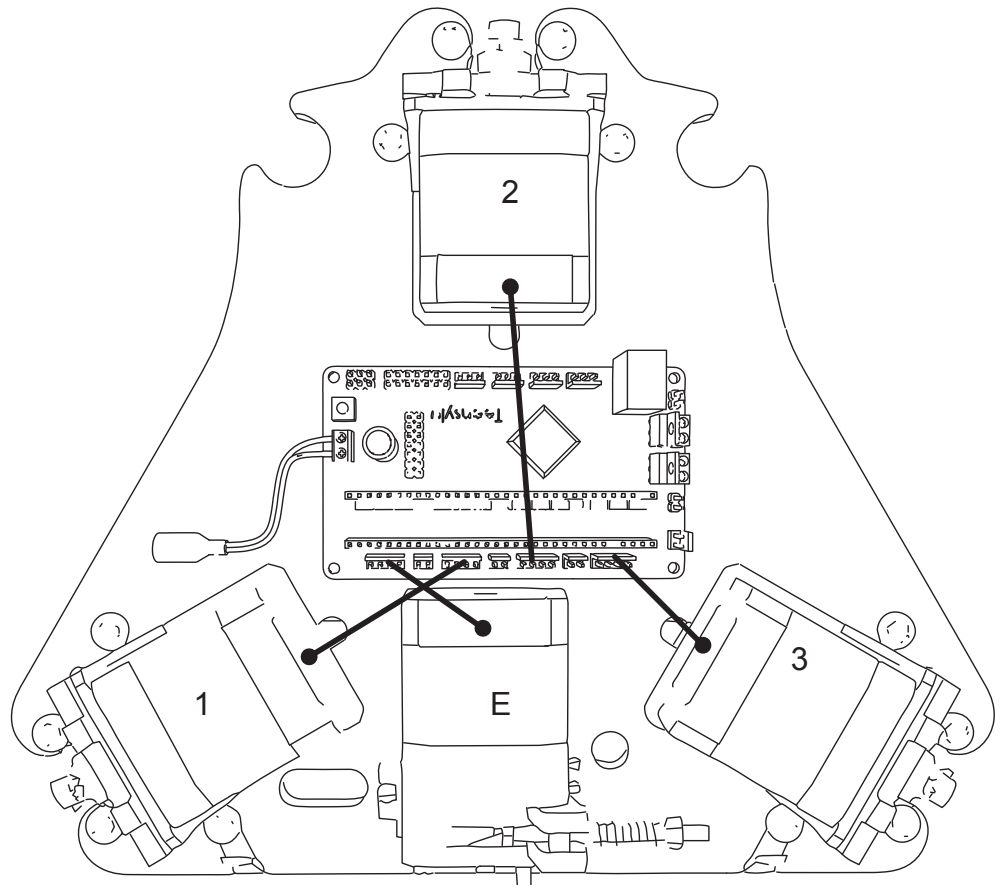


- Plug the endstops
- The endstops can be plugged in only one orientation

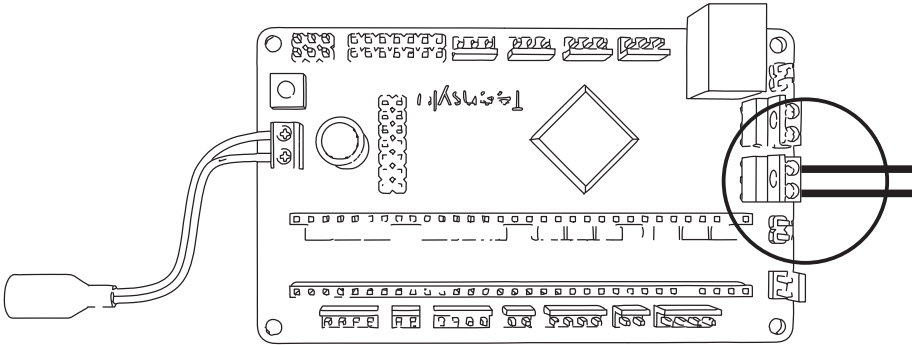




- Plug the motors
- The motors can be plugged in only one orientation

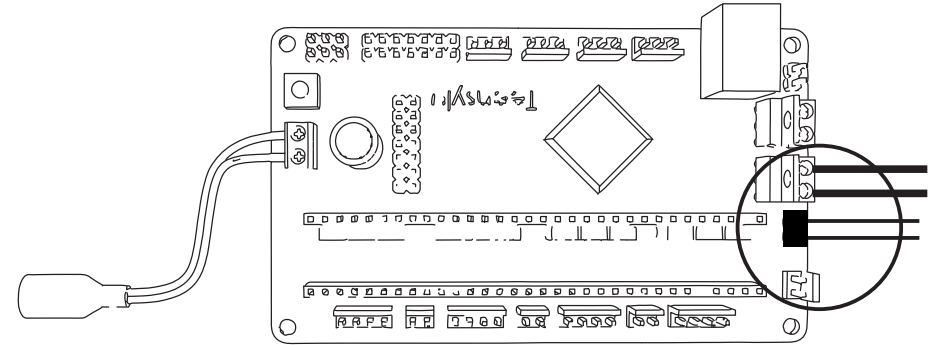


1



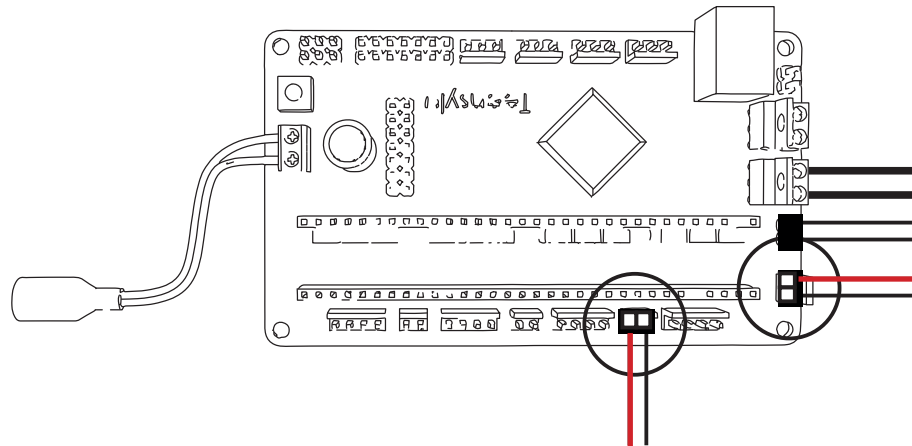
**Screw the cables of the cartridge heater**  
There is no specific way, don't forget to denude it

2



**Plug the thermistor**  
There is no specific way

3



**Plug the fans**  
There is no specific way

# **CONGRATULATION !**

You're printer is now operationnal





---

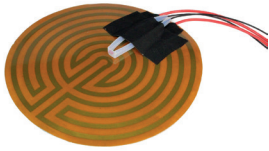
# ADD-ONS

---

## HEATED BED

### 1. Hardware update

Kit :



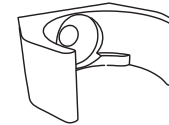
1x Adhesif heat patch



3x Idler



1x Tube



1x Tube mount



1x Polyimide tape

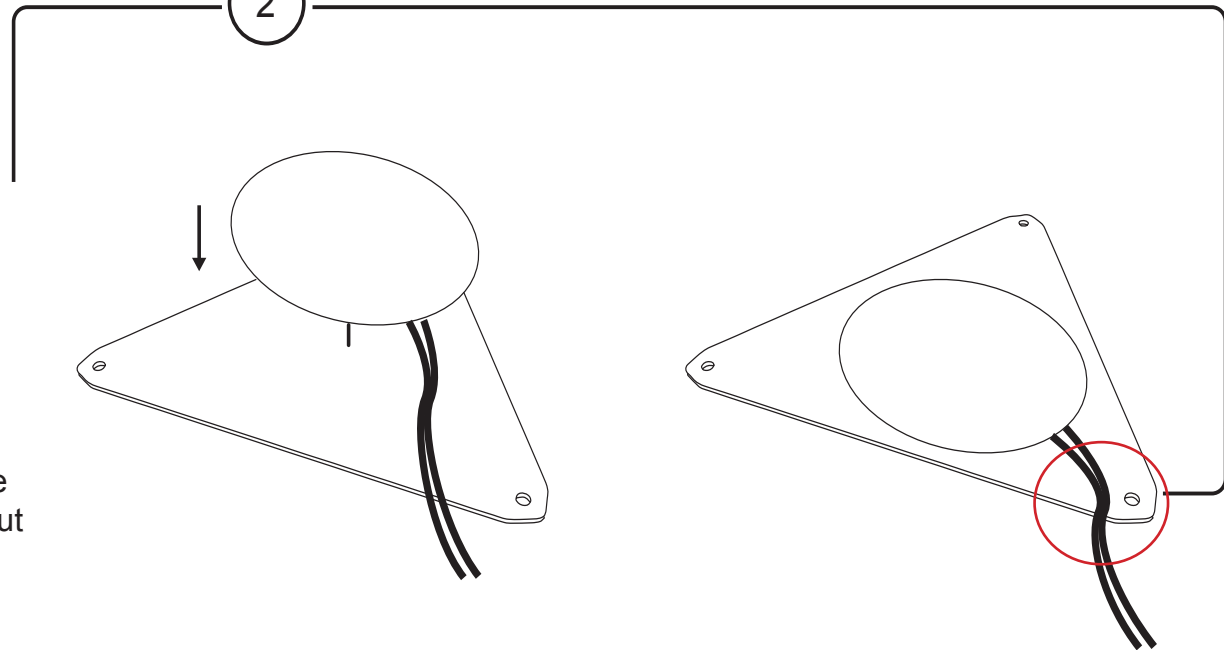
Prerequisite, you need an operational 3D printer



1 Remove the adhesif protection

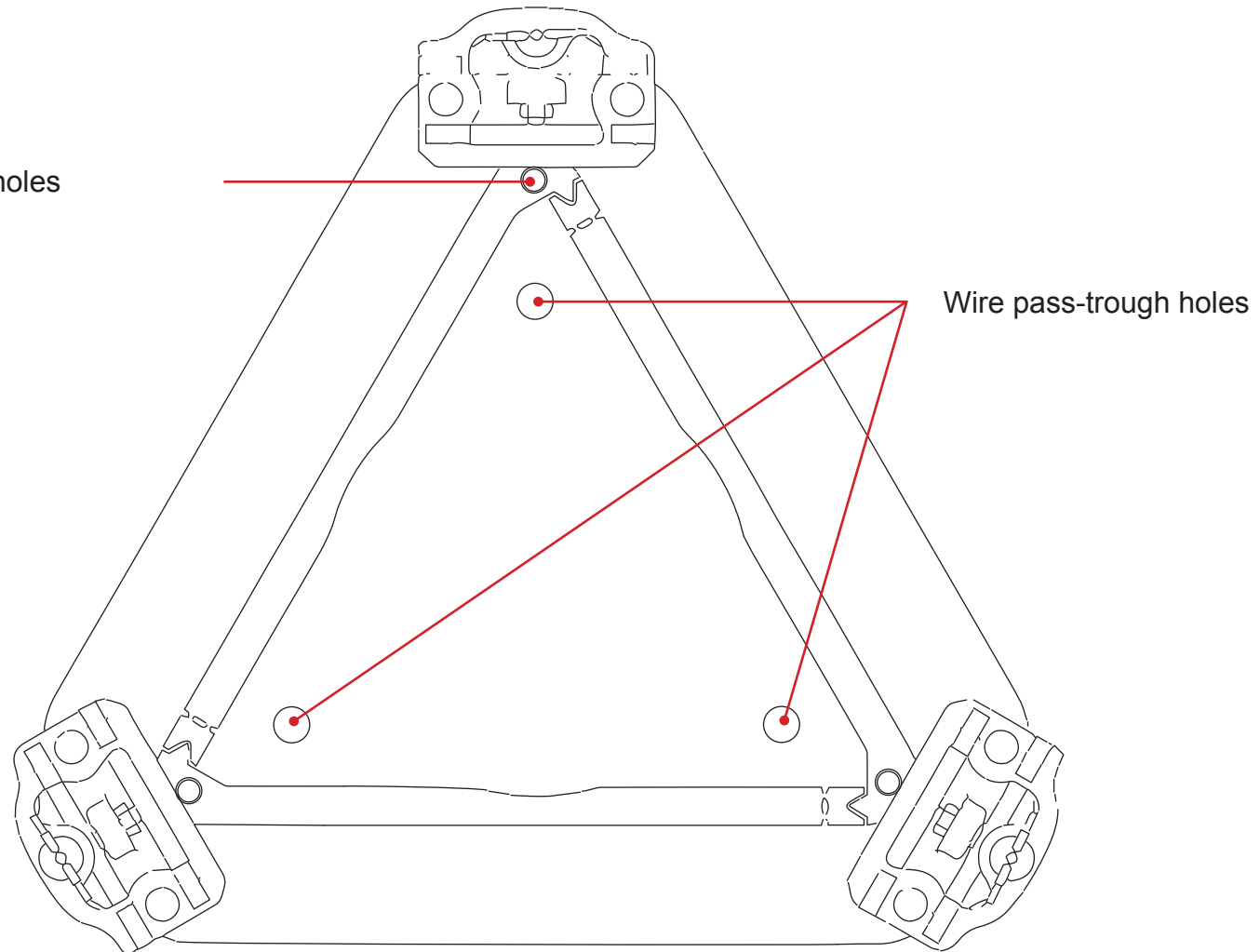


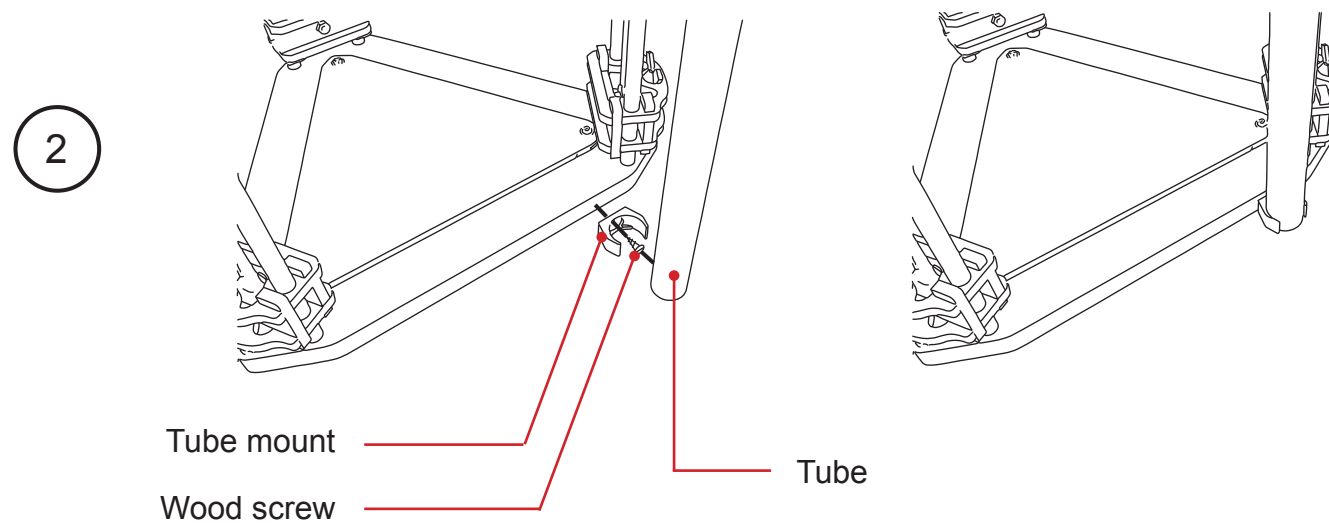
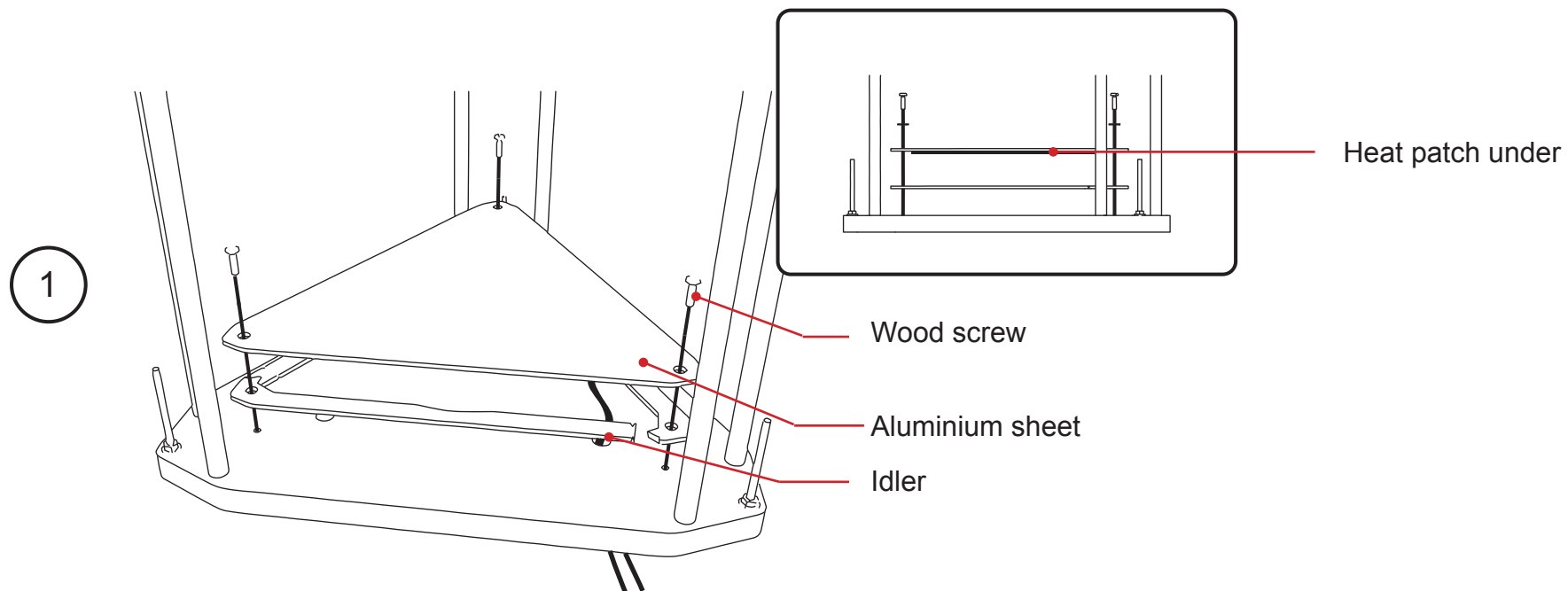
2

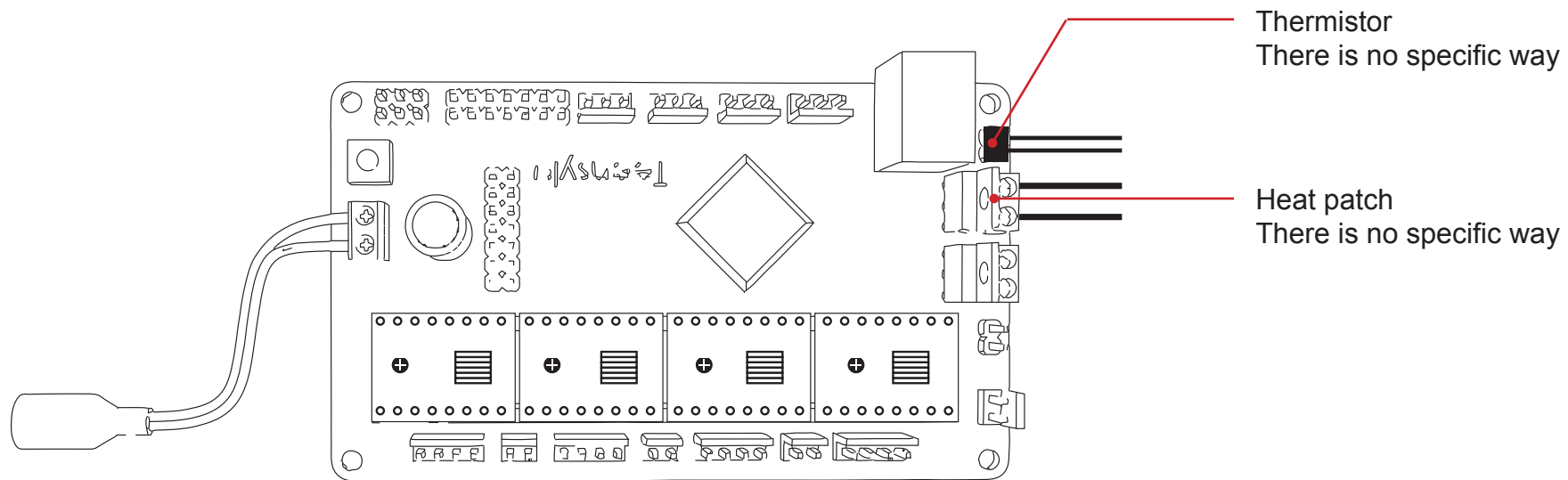


Patch the heatbed in the **center** of the aluminium sheet. Place the wire output **close to one hole**.

Place the idler and align all holes







## 2. Software update

### Prerequisite :

Computer with window 7+ (others OS coming soon)

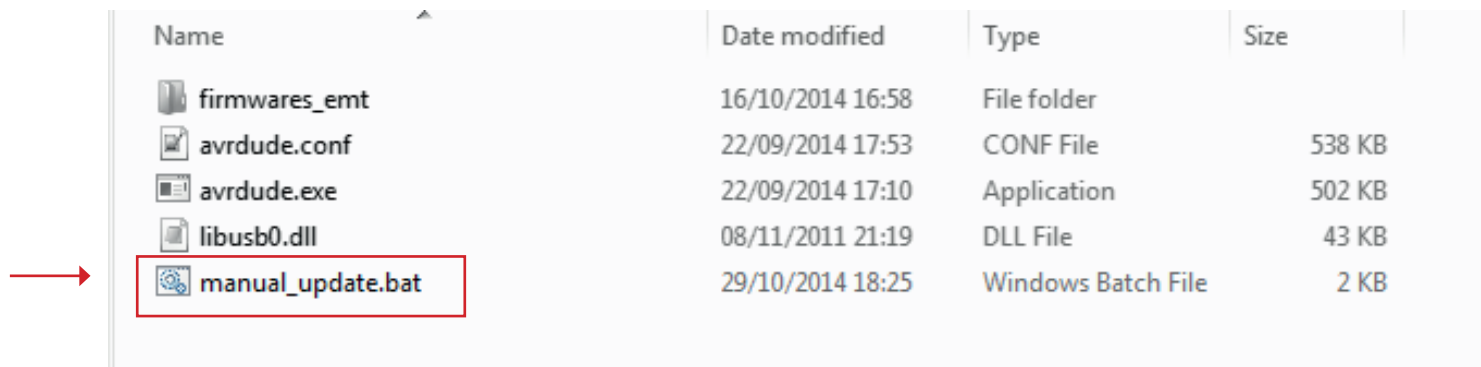
Download and install the Serial\_install.exe from our download center on our website

### Where download :

All files can be found on [our download center](#) or on [our github](#)

1/ Download the Manual\_update\_vx\_xx.zip

2/ Unzip the file and open the folder



Name	Date modified	Type	Size
firmwares_emt	16/10/2014 16:58	File folder	
avrdude.conf	22/09/2014 17:53	CONF File	538 KB
avrdude.exe	22/09/2014 17:10	Application	502 KB
libusb0.dll	08/11/2011 21:19	DLL File	43 KB
manual_update.bat	29/10/2014 18:25	Windows Batch File	2 KB

3/ Run the batch script .bat

## Choose the Firmware

Choose the firmware n°2,  
head bed without LCD

```
C:\Windows\system32\cmd.exe
TEENSILU FIRMWARE UPLOADER V1.00
from
=====
Exotion Tech
=====
Firmware upload:
=====
1: BASE
2: BED without LCD / LIT CHAUFFANT SANS LCD
3: LCD
4: BED + LCD / LIT CHAUFFANT + LCD
Firmware? _
```

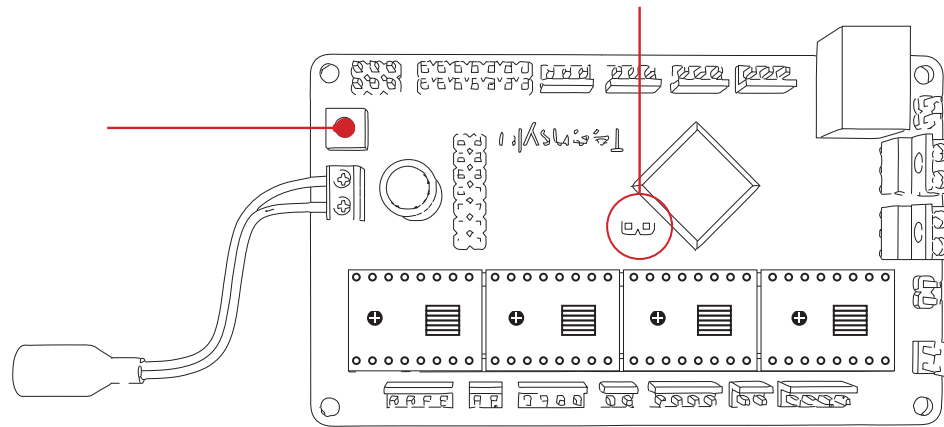
Press 2, and enter

```
C:\Windows\system32\cmd.exe
TEENSILU FIRMWARE UPLOADER V1.00
from
=====
Exotion Tech
=====
Firmware upload:
=====
1: BASE
2: BED without LCD / LIT CHAUFFANT SANS LCD
3: LCD
4: BED + LCD / LIT CHAUFFANT + LCD
Firmware? 2
Updater will upload the file: "firmwares_ent\uDelta_Base_v1.00.hex"
Remove the jumper close to the main chip and press reset on your board,
it will switch to programming mode
//fr: Enlevez le cavalier proche de la teensylu et appuyez sur le bouton Reset
Press any key to continue . . . _
```

Select the programming mode

1/ Remove the jumper

2/ Press the reset button



Please wait patiently before you computer detect and install the new COM port

Press Enter key and check your COM port name :

Ports are detected here



```

C:\Windows\system32\cmd.exe
+++++
=====
Firmware upload:
=====
1: BASE
2: BED without LCD / LIT CHAUFFANT SANS LCD
3: LCD
4: BED + LCD / LIT CHAUFFANT + LCD
Firmware? 1
=====
Updater will upload the file: "firmwares_empt\Delta_Base_v1.00.hex"
Remove the jumper close to the main chip and press reset on your board,
it will switch to programming mode
//fr: Enlevez le cavalier proche de la teensylu et appuyez sur le bouton Reset
Press any key to continue . . .
=====PORT SCANNER=====
COM1:
COM26:
=====
CAUTION! Write down your portname using the format "COMX" where X is your port n
umber
fr: ECRIVEZ VOTRE PORT SOUS LA FORME "COMX" X etant le numero de port
PORT:

```

Note : Usually, the COM1 is your internal modem device, COM1 might not be the right port.



Caution: the syntax have to be perfect, ex: COM2

Type your COM port name (COM26 in our case) then press Enter key

```
C:\Windows\system32\cmd.exe

Remove the jumper close to the main chip and press reset on your board,
it will switch to programming mode
//fr: Enlevez le cavalier proche de la teensylu et appuyez sur le bouton Reset
Press any key to continue . . .
=====PORT SCANNER=====
COM1:
COM26:
=====
CAUTION! Write down your portname using the format "COMX" where X is your port number
fr: ECRIVEZ VOTRE PORT SOUS LA FORME "COMX" X étant le numero de port
PORT: COM26

avrdude.exe: Version 5.11, compiled on Sep  2 2011 at 19:38:36
Copyright (c) 2000-2005 Brian Dean, http://www.bdmicro.com/
Copyright (c) 2007-2009 Joerg Wunsch

System wide configuration file is "C:\Users\ghunt\Desktop\demo\Manual_Update_v1.0\avrdude.conf"

Using Port                : \\.\COM26
Using Programmer           : avr109
Overriding Baud Rate       : 115200
```

Your screen will be filled with the hexadecimal data transfer

```
C:\Windows\system32\cmd.exe

[1] " [22] \ [60] . [93] . [19] . [10] p [70] . [93] . [1a] . [10] . [80] . [93] .
[1b] . [10] . [90] . [93] . [1c] . [10] . [89] . [e8] . [90] . [e0] . [0e] . [9
4] . [bc] " [22] \ [60] . [93] . [21] . [10] p [70] . [93] " [22] . [10] . [80]
. [93] # [23] . [10] . [90] . [93] $ [24] . [10] . [8d] . [e8] . [90] . [e0] . [
0e] . [94] . [bc] " [22] \ [60] . [93] > [29] . [10] p [70] . [93] * [2a] . [10]
. [80] . [93] + [2b] . [10] . [90] . [93] [2c] . [10] . [81] . [e9] . [90] .
[e0] . [0e] . [94] . [bc] " [22] \ [60] . [93] . [15] . [10] p [70] . [93] . [16
] . [10] . [80] . [93] . [17] . [10] . [90] . [93] . [18] . [10] . [85] . [e9] .
[90] . [e0] . [0e] . [94] . [bc] " [22] \ [60] . [93] . [1d] . [10] p [70] . [9
3] . [1e] . [10] . [80] . [93] . [1f] . [10] . [90] . [93] . [20] . [10] . [89]
. [e9] . [90] . [e0] . [0e] . [94] . [bc] " [22] \ [60] . [93] % [25] . [10] p [
70] . [93] & [26] . [10] . [80] . [93] ' [27] . [10] . [90] . [93] < [28] . [10]
. [82] . [e0] . [8d] . [15] . [08] . [f0] P [50] . [c0] . [01] . [e8] . [1f] .
[e0] x [78] . [01] . [c0] . [e0] . [d0] . [e0] . [ce] . [01] . [88] . [0f] . [99
] . [1f] . [88] . [0f] . [99] . [1f] . [84] [ [5b] [9c] 0 [4f] . [0e] . [94] .
[bc] " [22] . [f7] . [01] a [61] . [93] q [71] . [93] . [81] . [93] . [91] . [9
3] . [7f] . [01] ! [21] . [96] . [c9] 0 [30] . [d1] . [05] i [69] . [f7] . [20]
. [91] . [81] . [0f] 0 [30] . [91] . [82] . [0f] e [40] . [91] . [83] . [0f] P [
50] . [91] . [84] . [0f] . [ca] . [01] . [b9] . [01] . [0e] . [94] . [8f] . [84]
. [88] # [23] . [a1] . [f0] . [cc] . [e4] . [d3] . [e0] . [ce] . [01]
avrdude.exe: Recv:  [0d]
avrdude.exe: Send: B [42] . [01] . [00] F [46] . [88] . [0f] . [99] . [1f] . [88
] . [0f] . [99] . [1f] . [0e] . [94] . [bc] " [22] . [f8] . [01] a [61] . [93] q
[71] . [93] . [81] . [93] . [91] . [93] . [8f] . [01] ! [21] . [96] . [f3] . [e
0] . [c5] 5 [35] . [df] . [07] q [71] . [f7] . [f9] . [99] . [fe] .
```

Final screen :

```

C:\Windows\system32\cmd.exe

avrdude.exe: safemode: hfuse reads as DB
avrdude.exe: Send: Q [51]
avrdude.exe: Recv: . [f0]
avrdude.exe: safemode read 1, efuse value: f0
avrdude.exe: Send: Q [51]
avrdude.exe: Recv: . [f0]
avrdude.exe: safemode read 2, efuse value: f0
avrdude.exe: Send: Q [51]
avrdude.exe: Recv: . [f0]
avrdude.exe: safemode read 3, efuse value: f0
avrdude.exe: safemode: efuse reads as F0
avrdude.exe: safemode: Fuses OK
avrdude.exe: Send: L [4c]
avrdude.exe: Recv: . [0d]
avrdude.exe: Send: E [45]
avrdude.exe: Recv: . [0d]

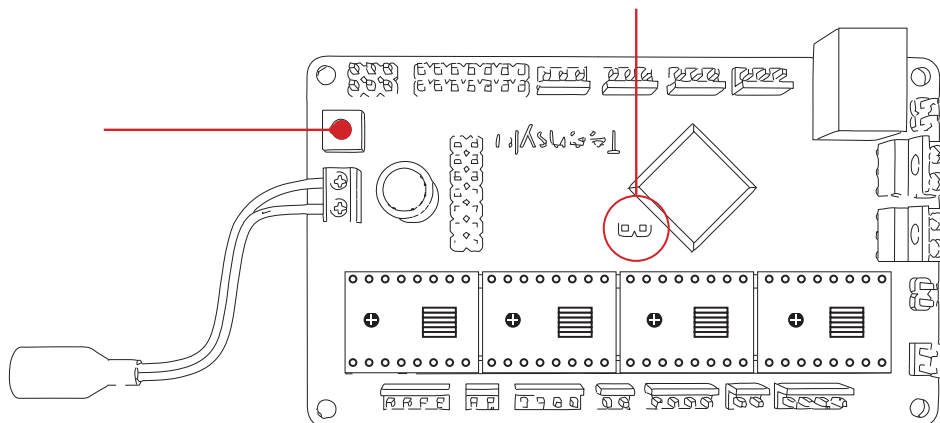
avrdude.exe done. Thank you.

001001
PS: Do not forget to restore the jumper and press reset to switch to normal mode
PS: //fr: oubliez pas de remettre le cavalier et rappuyer sur reset...
Enjoy!
Press any key to continue . . .
  
```

Leave the programming mode :

1/ Set up the jumper back in place

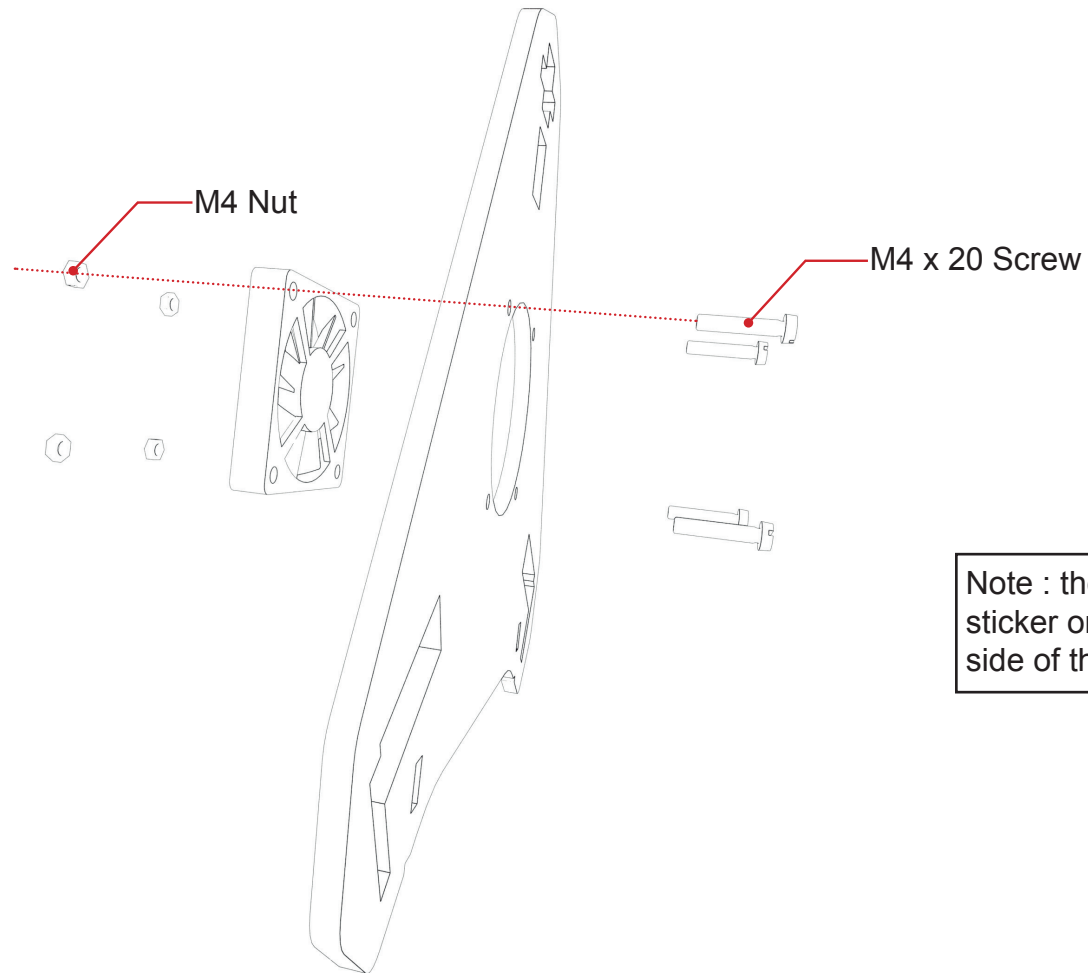
2/ Press the reset button



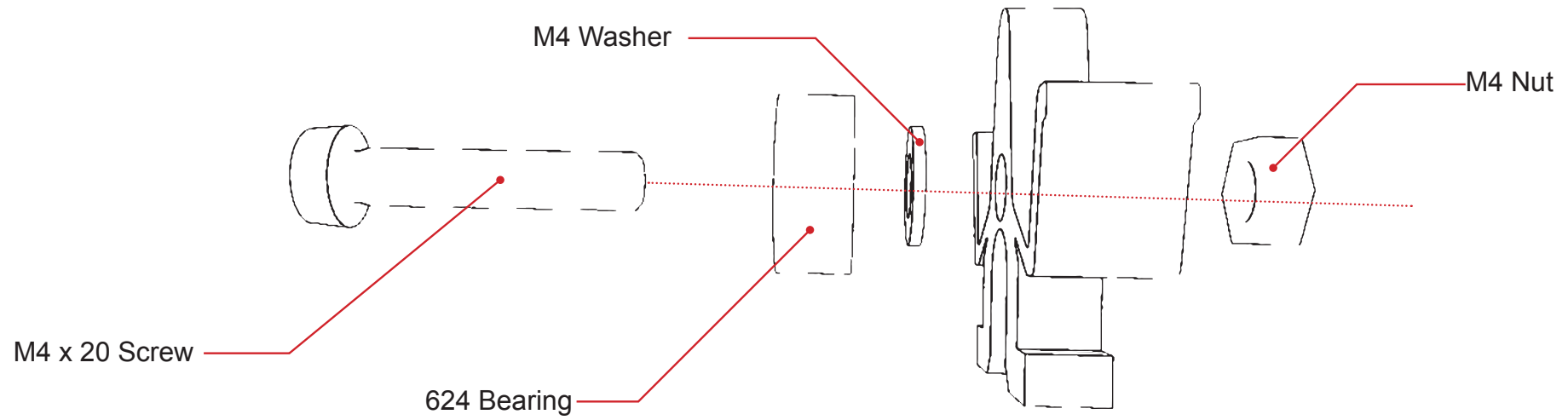
Your printer is now ready to print with the heated bed !

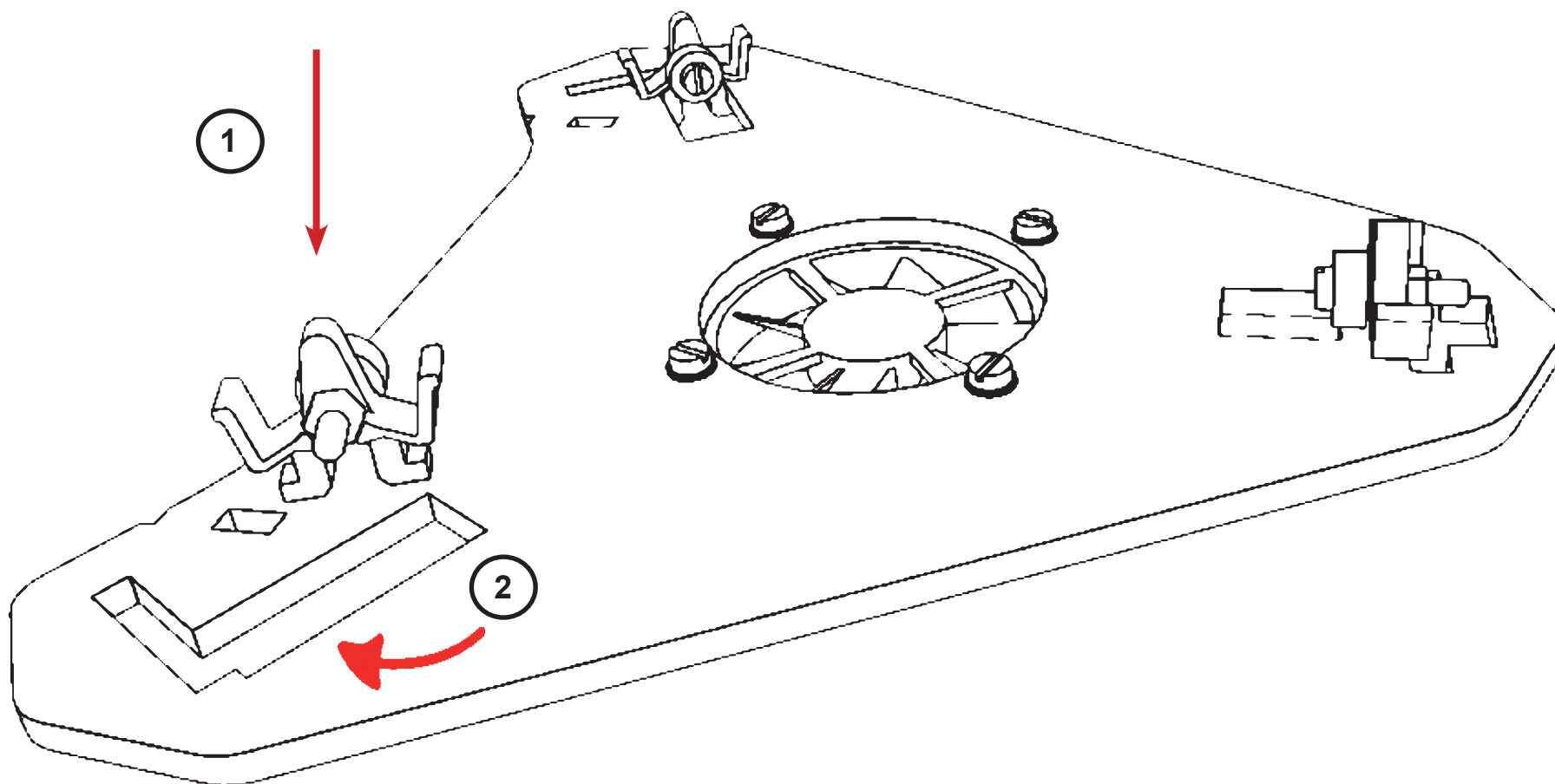
## SPOOL HOLDER

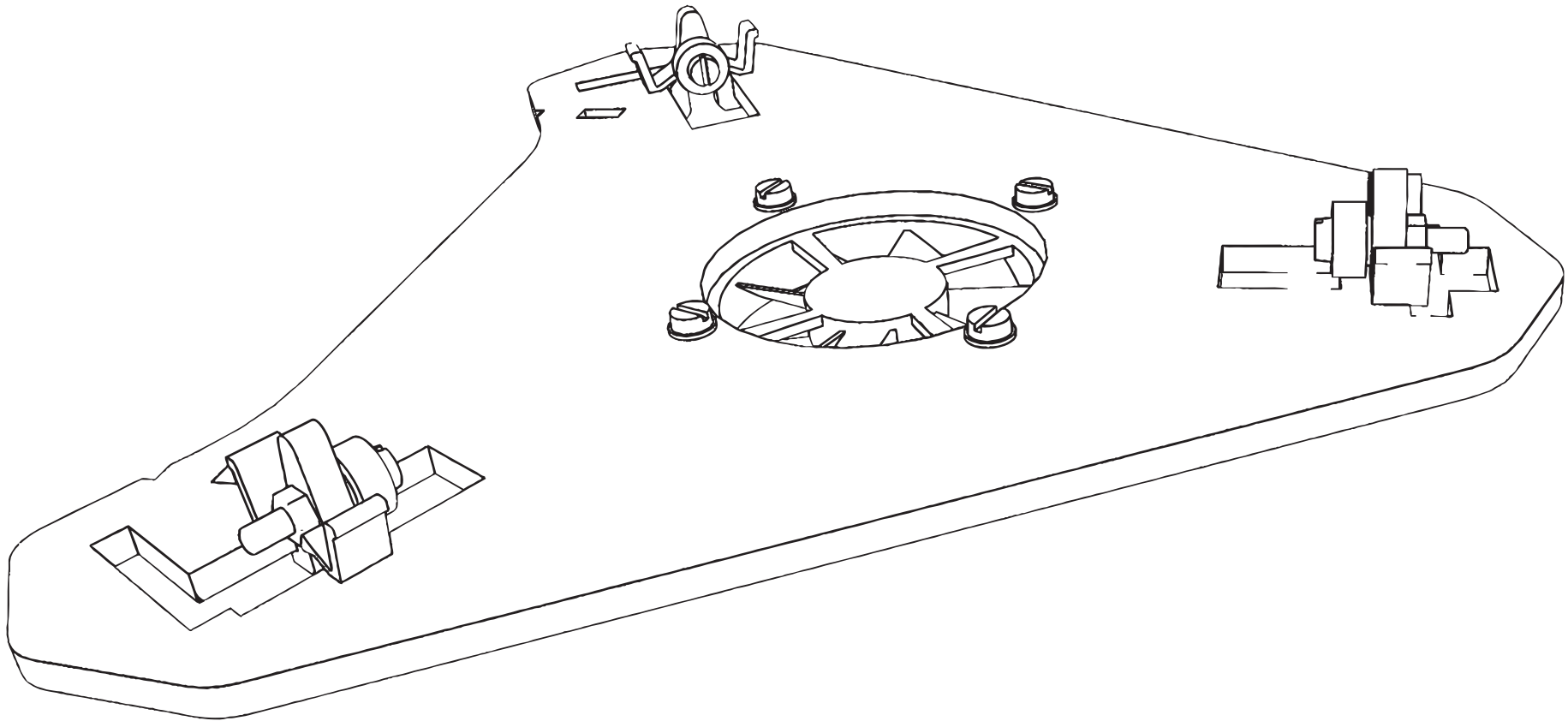
### 1. Hardware update

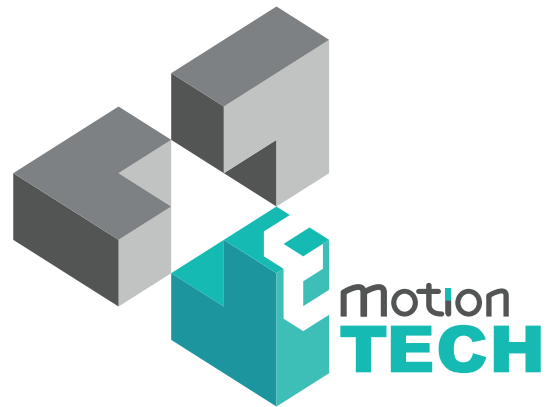


Note : the fan must have the sticker oriented in the opposite side of the acrylic part









Thank you for choosing the  $\mu$ Delta