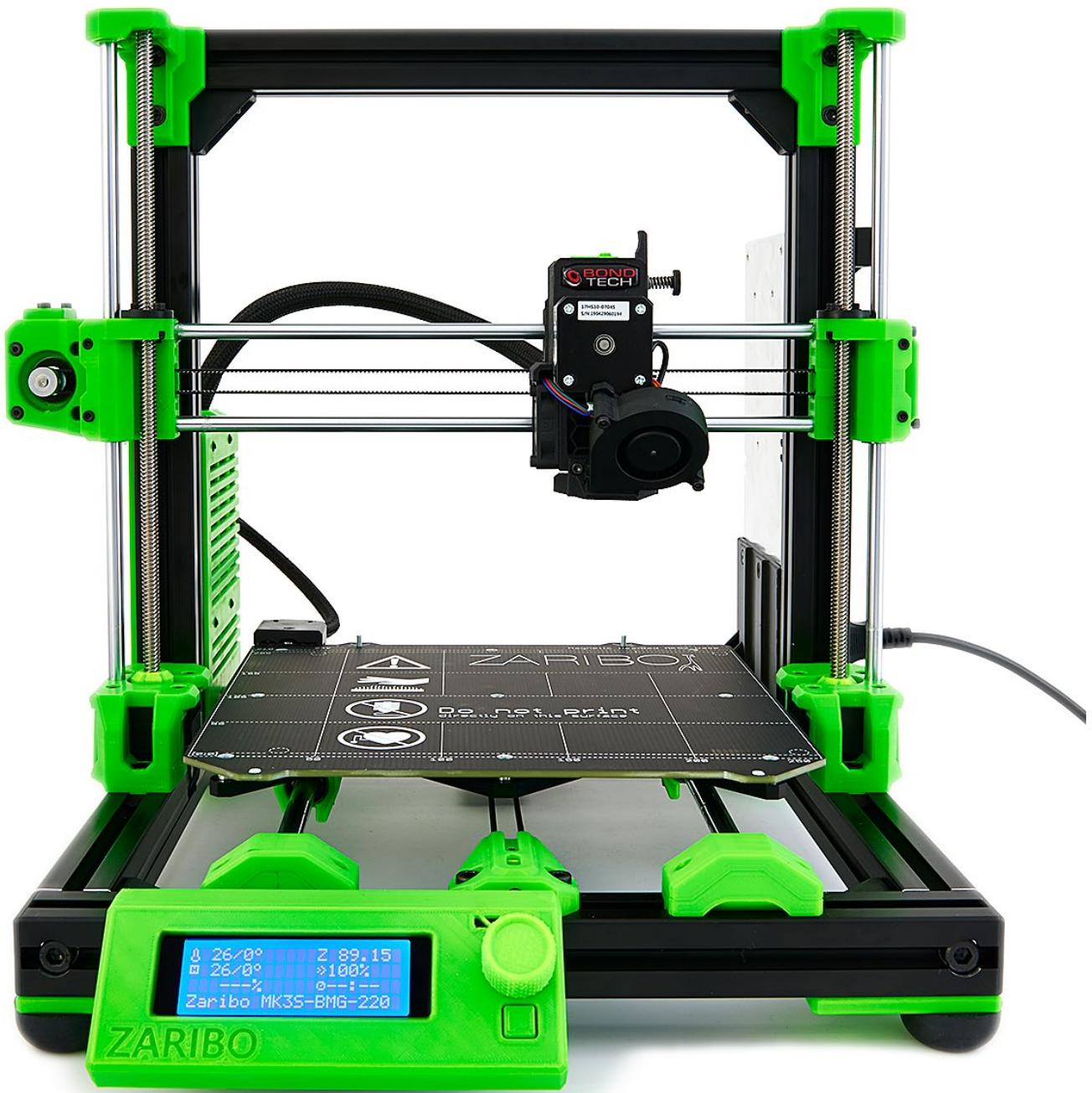


# Zaribo MK3 Rel 3

Assembly Manual

Version 0.85  
26.08.2019



ZARIBO  
Research & Development



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**USE AT YOUR OWN RISK:** Never leave your printer unattended!

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Photography: Henry Schadow, Wolfgang Schadow

# 1 DISCLAIMER:

This is a kit of components for assembly into a 3D Printer by the end user. Building and using the printer is potentially very dangerous as it involves electricity and high temperatures.

Building the printer will require a certain amount of physical dexterity, common sense and a thorough understanding of what you are doing. We have provided fully comprehensive build documentation to enable you to build your Zaribo 3d Printer Kit in a safe manner.

However ultimately, we cannot be responsible for your health and safety while building or operating the printer. With that in mind be sure you are confident with what you are doing prior to buying or building a 3d printer.

Building and operating involves electricity, so all necessary precautions should be taken and adhered to, the printer runs on 110V-220V supplied by a certified power supply.

High temperatures are involved with 3D Printing, the Extrusion nozzle of the hot end runs at 190-285 °C. The heated bed runs at up to 110 °C and the molten plastic extruded will initially be up to 280 °C. Special care and attention should be made when handling these parts of the printer during operation.

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## 2 LIST OF TOOLS

### Necessary:

- ball-headed hex keys in sizes 2.5mm,, 5mm, 6mm
- hex keys in sizes 1.5mm, 2mm
- ratchet with 5mm and 6mm hex bits
- pliers
- calipers (at least 162mm width)
- wrenches in sizes 7mm, 16mm
- phillips and slotted screwdriver
- scalpel or cutter knife
- scissors
- permanent marker (thin)
- lighter
- right angle ruler

### Additionally recommended:

- smooth tongue-and-groove pliers
- cutting pliers
- rubber hammer
- 5.5mm nut driver
- common sense

## 3 GENERAL NOTICE

Before you proceed with any of the construction steps, please do the following:

1. Make sure that the required parts (which are listed at the beginning of each chapter) are all present, correct and not damaged. If that isn't the case, please contact our support and we will provide you with a replacement as quickly as possible
2. Though we remove it for you, check all plastic parts for support material just to be sure
3. Make sure to have access to all of the listed tools. Do not attempt to build without these as the use of incorrect tools may lead to breakage of parts or a faulty construction. If a tool that we use is optional, it will be noted at the corresponding step
4. Orient all self securing nuts with the thicker end towards the screw.

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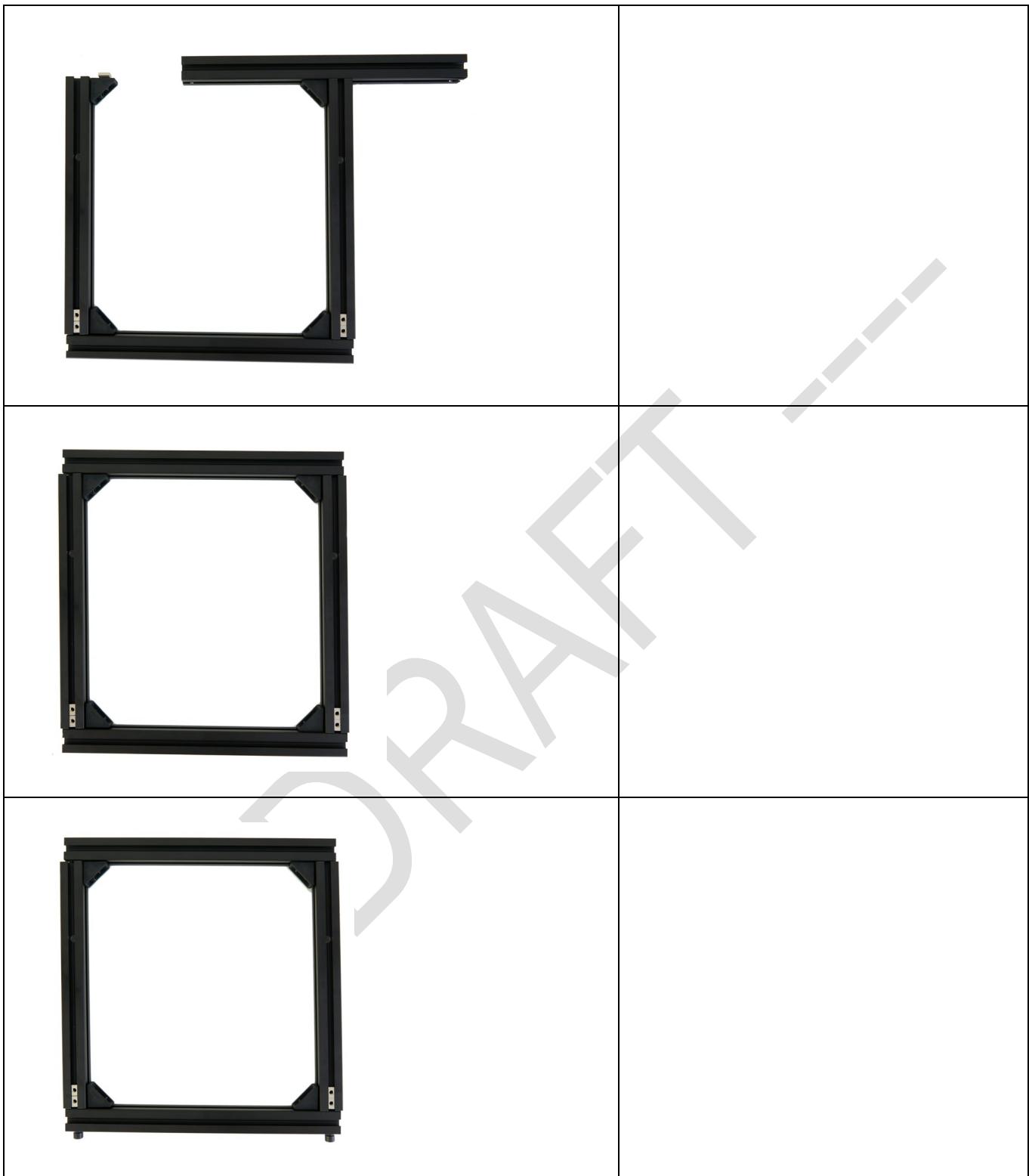
# 4 ASSEMBLY INSTRUCTIONS

## 4.1 XY-FRAME

### 4.1.1 BASE FRAME ASSEMBLY

<p><b>Important:</b> Make sure that the surface that you are working on is perfectly flat. By using an uneven work surface, you risk building a skewed frame, which may lead to the printer not being able to be calibrated.</p>	

	<p>Prepare all (total is 8) and at least four corner brackets in the following way: Insert a M6 x 12mm screw to one of the holes of the bracket.</p>
	<p>Screw a T-nut on the M6 x 12mm screw. Top and side view of the bracket.</p>
	
	

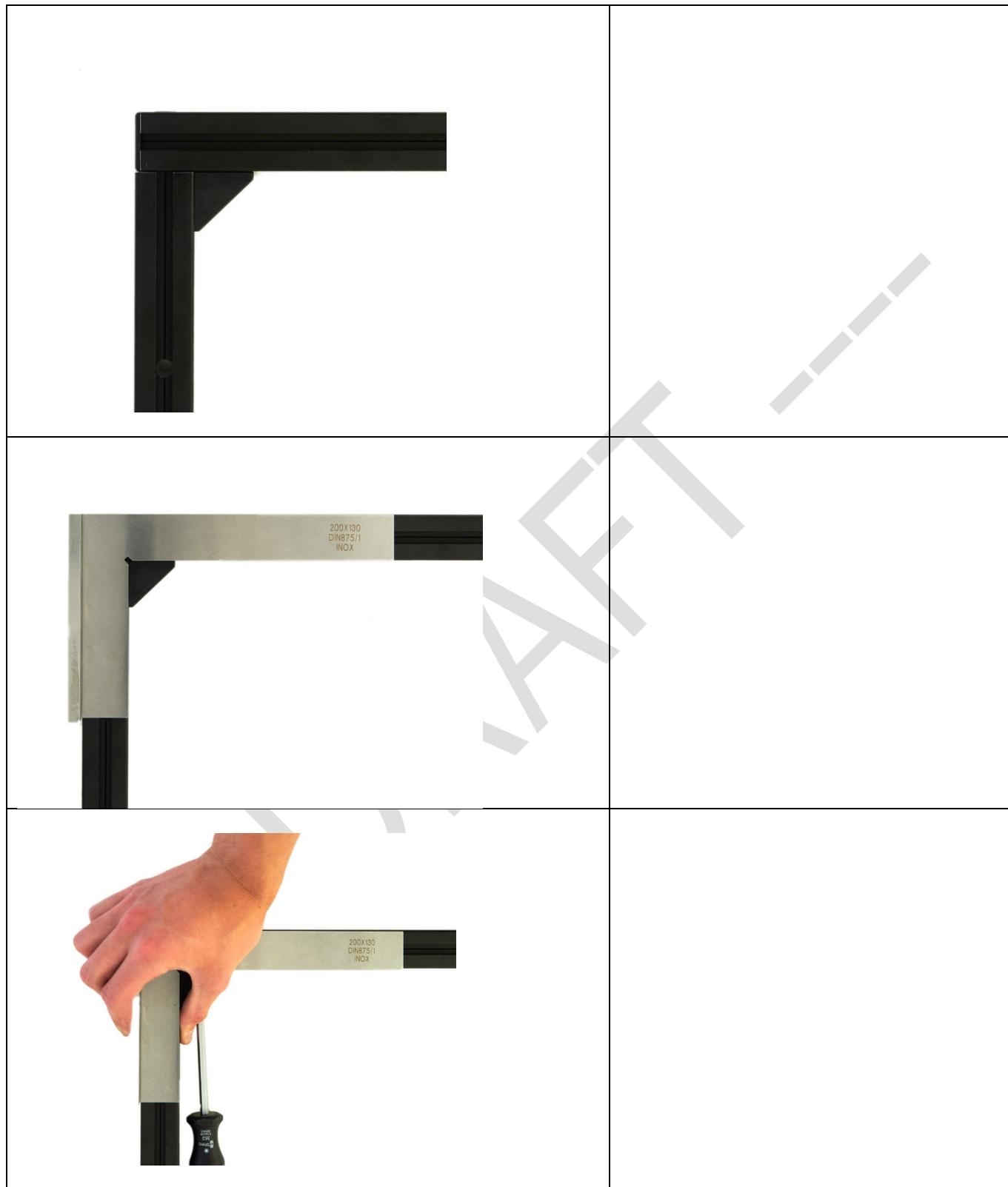






	<p>IMPORTANT: slide in 2 T-nuts in the front slot of the front extrusions. They will be used to attach the LCD.</p>
	
	

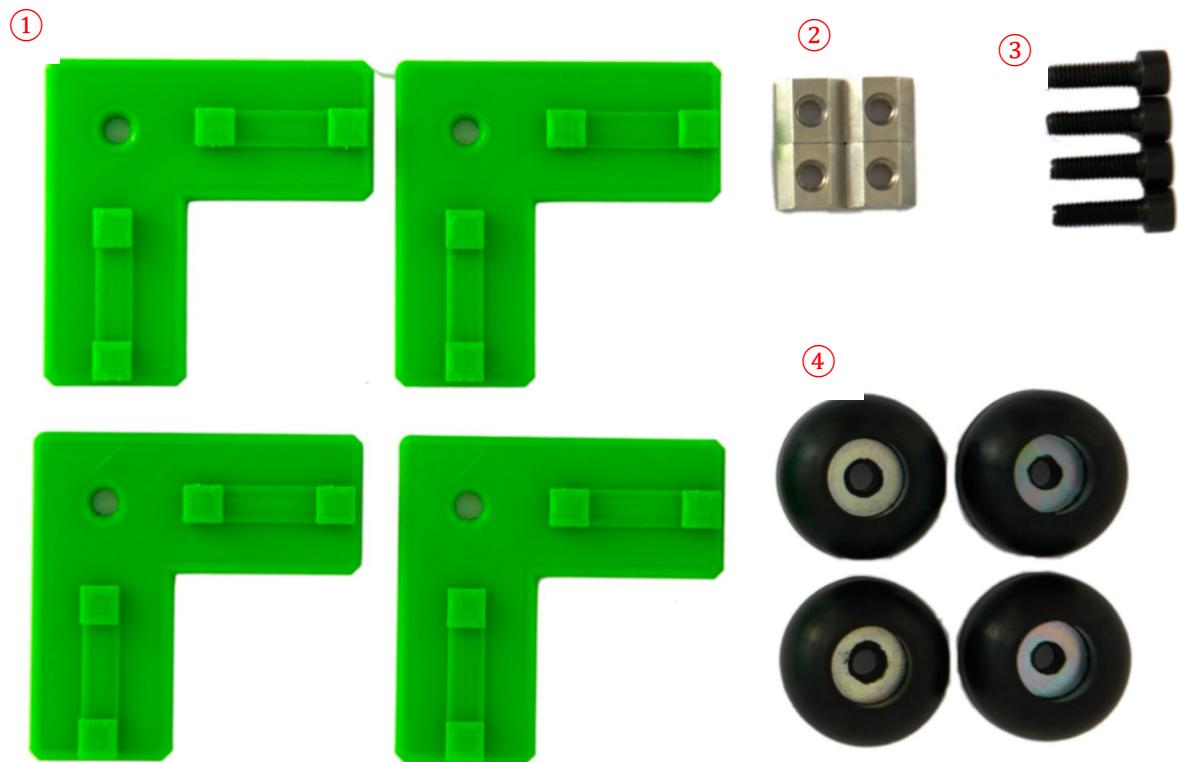






	
	OPTIONAL: if you own calipers that are 300m long. Measure the front.
	And back of the frame. You should measure $299.8 \pm 0.2$ . It is important that you have the same distance in the back and front up to 0.1mm or better.
	<p>Slide in <b>6 T-nuts</b> in top slot of the front extrusion.</p> <p>Slide in <b>8 T-nuts</b> in the top slot of the back extrusion.</p> <p>Now the top of your frame should look like this.</p>

#### 4.1.2 L-BRACKET AND FEET INSTALLATION



① L-brackets 4x)

② T-Nut (4x)

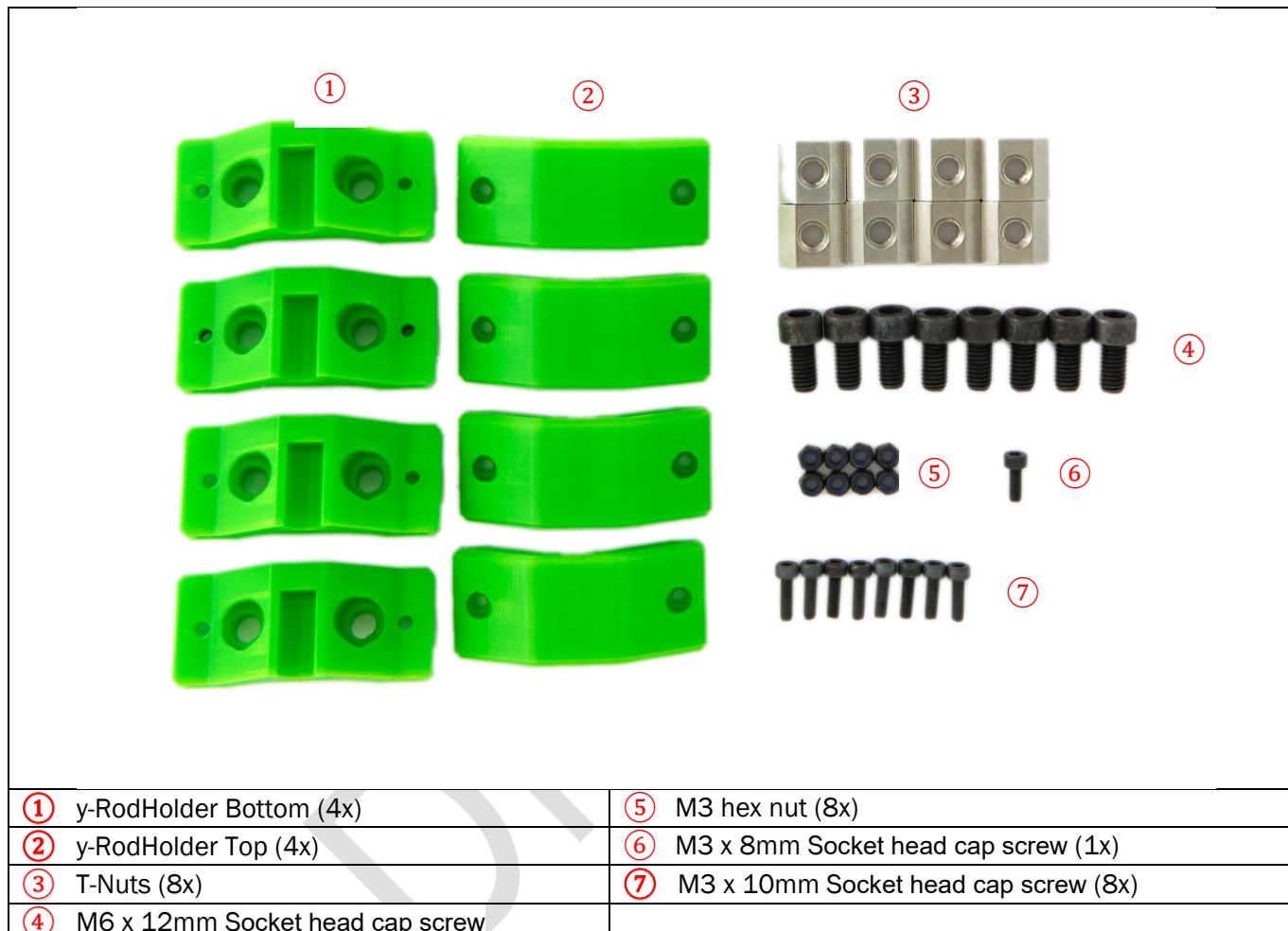
③ M6 x 20mm Socket head cap screw

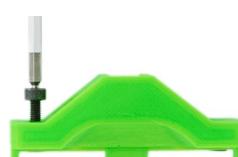
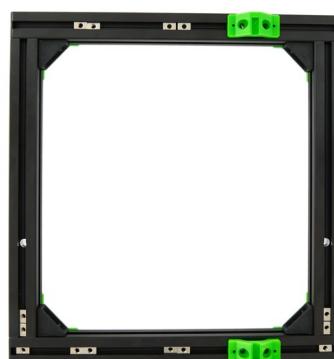
④ Misumi rubber feet

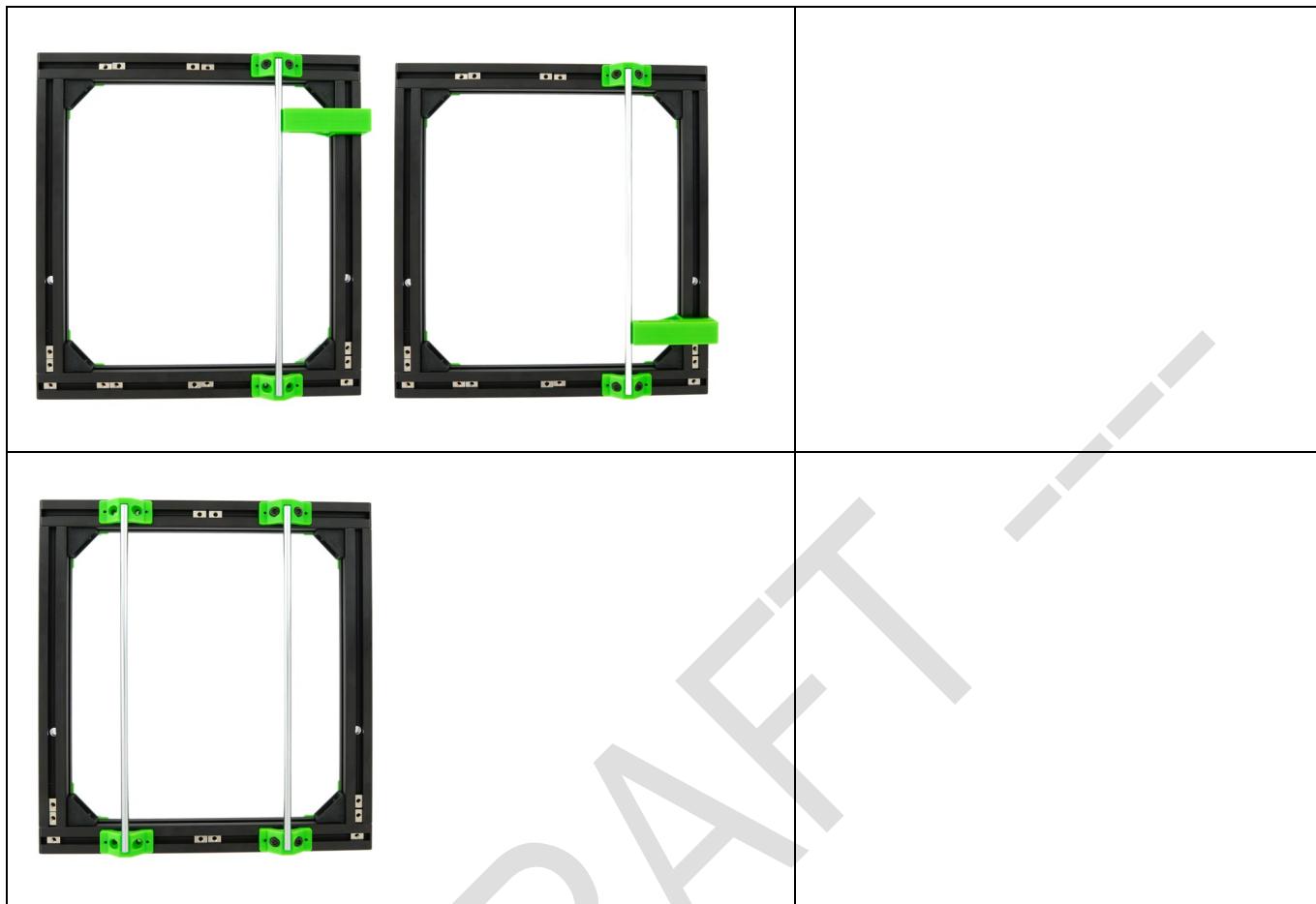
	Flip the frame upside down, remove the two extrusion caps from the left side.
	Insert two T-nuts into the (now) upper slots of each extrusion.
	For each corner, set a T-nut in the position as seen in the picture, and place a plastic L-bracket over it.
	For each corner, place one of the rubber feet onto the bracket. Use a <b>M6x20mm</b> screw to secure it and the L-bracket into place.

## 4.2 Y-AXIS ASSEMBLY

### 4.2.1 Y-ROD INSTALLATION

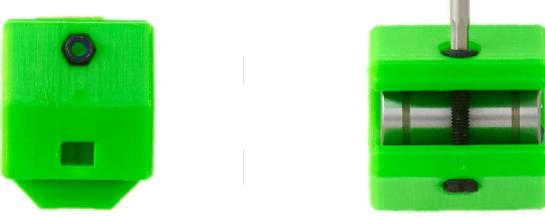


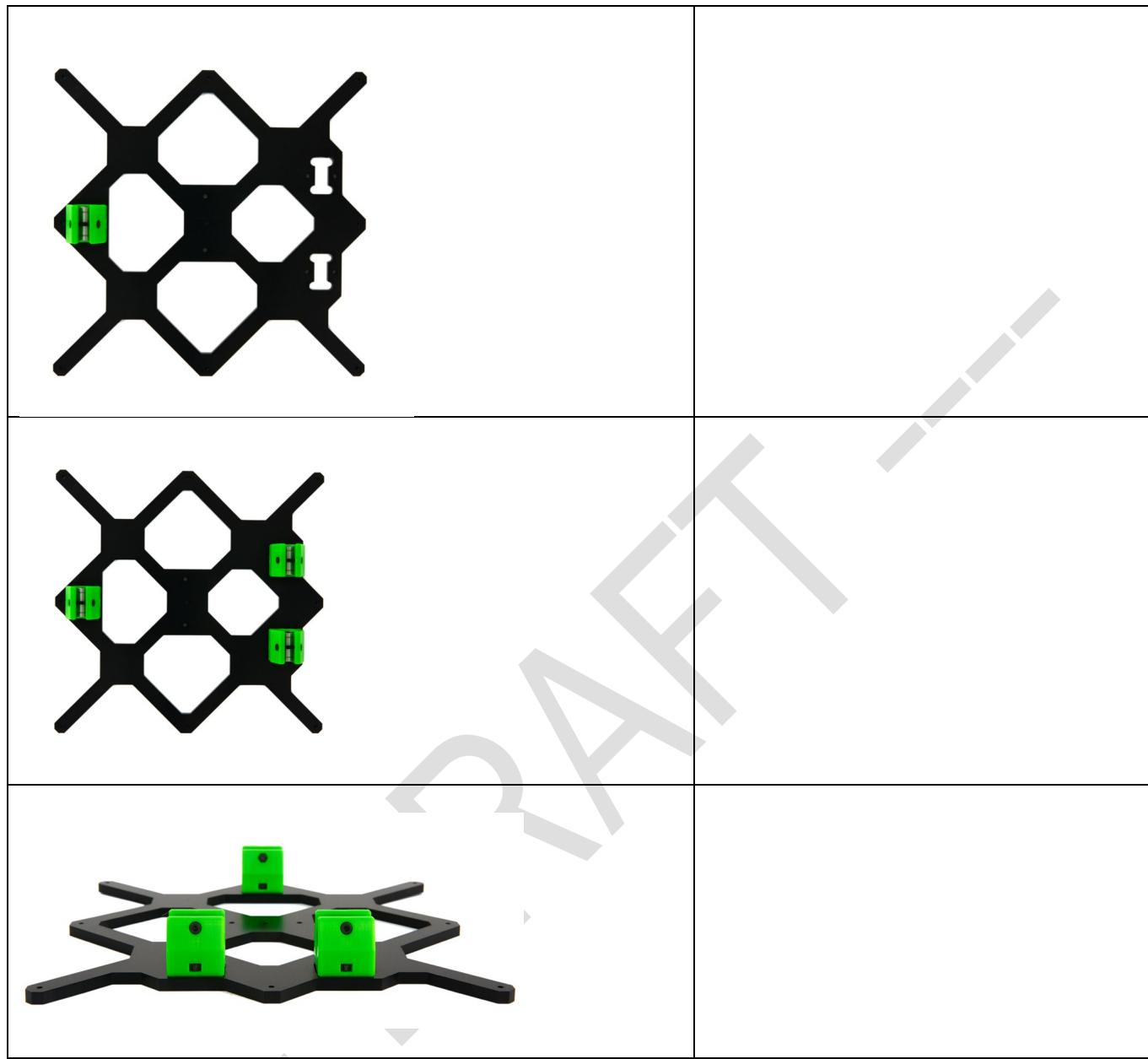
		<p>Take the four Y-rodholder bottom parts and insert two M3 hex nut at the bottom. Use pliers to push the into.</p>
		<p>By screwing in the M3 x 8mm screw pull the M3 nut fully into the hole of the rod holder. Remove the screw after pulling the nut inside and proceed to the second hole. Do the same for all 4 rod holders</p>
		<p>Bring the frame that you built so into the following position. Position the T-nuts in the extrusion like shown in the picture.</p>
		

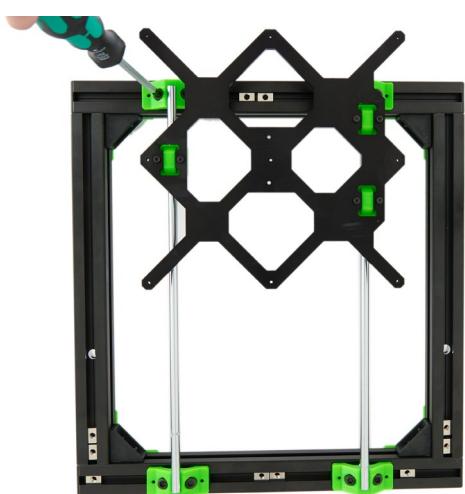


## 4.2.2 INSTALLATION OF THE HEATBED CARRIAGE

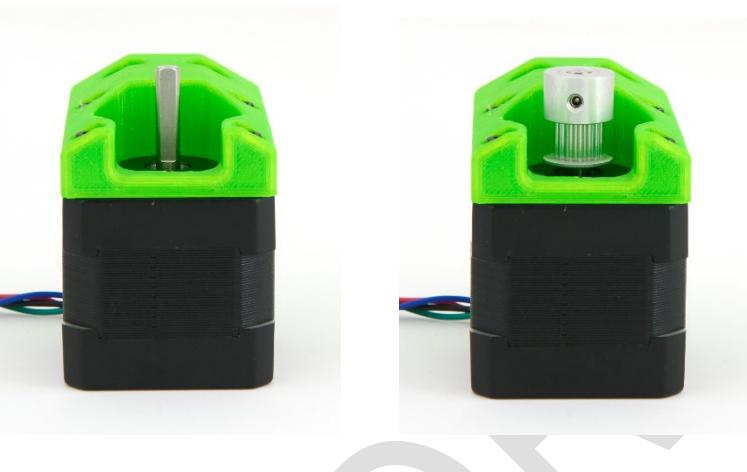
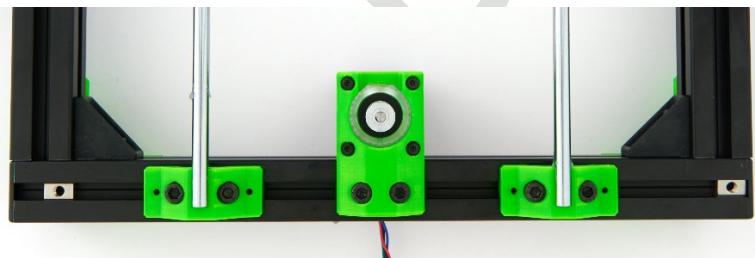


	
	
	
	
	<p>Insert 2 <b>M3 nyloc nuts</b> on each side of the bearing holder. Make sure they are inserted properly by making sure you can see the center of the nut from the top.</p>





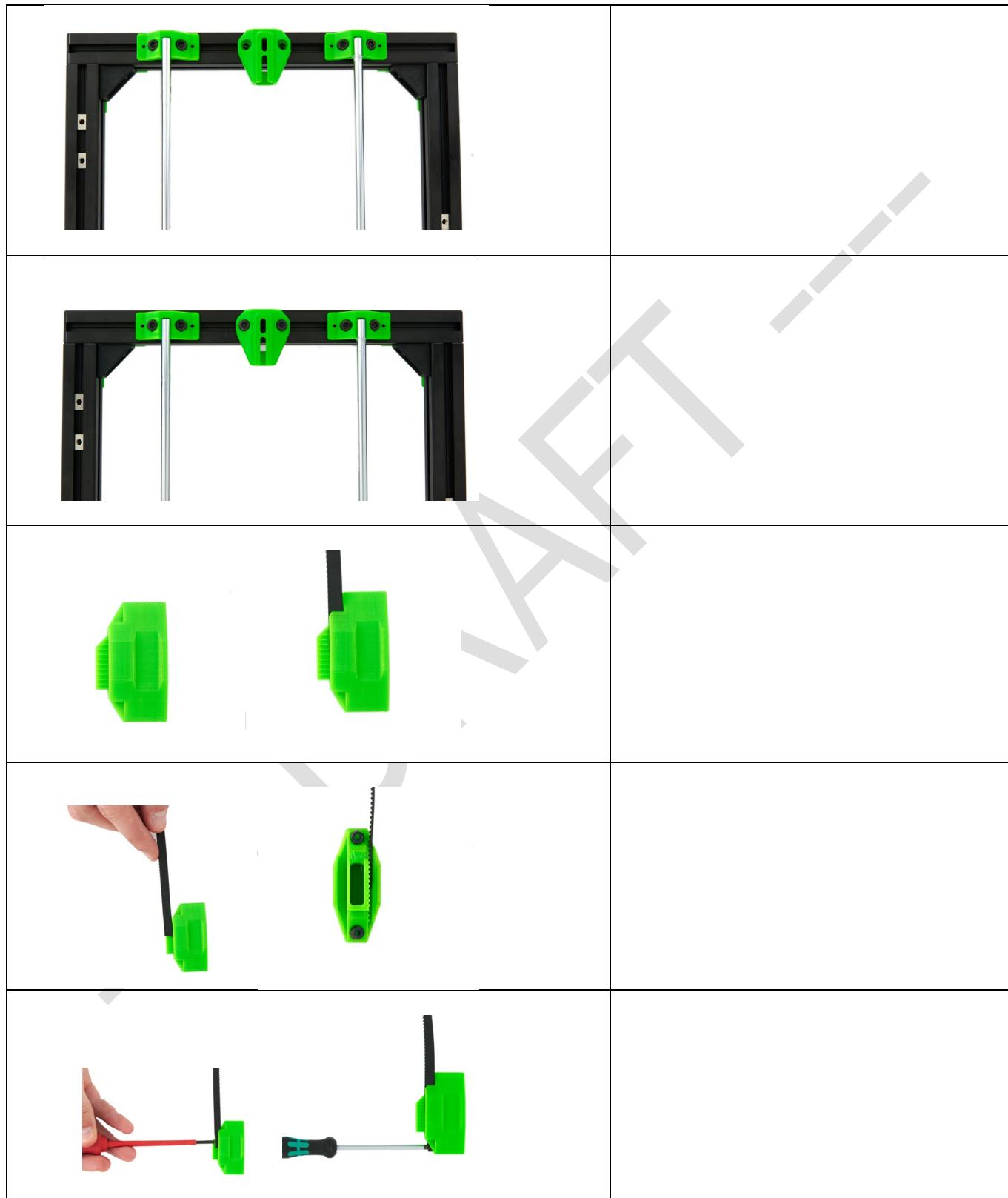
### 4.2.3 Y-MOTOR ASSEMBLY

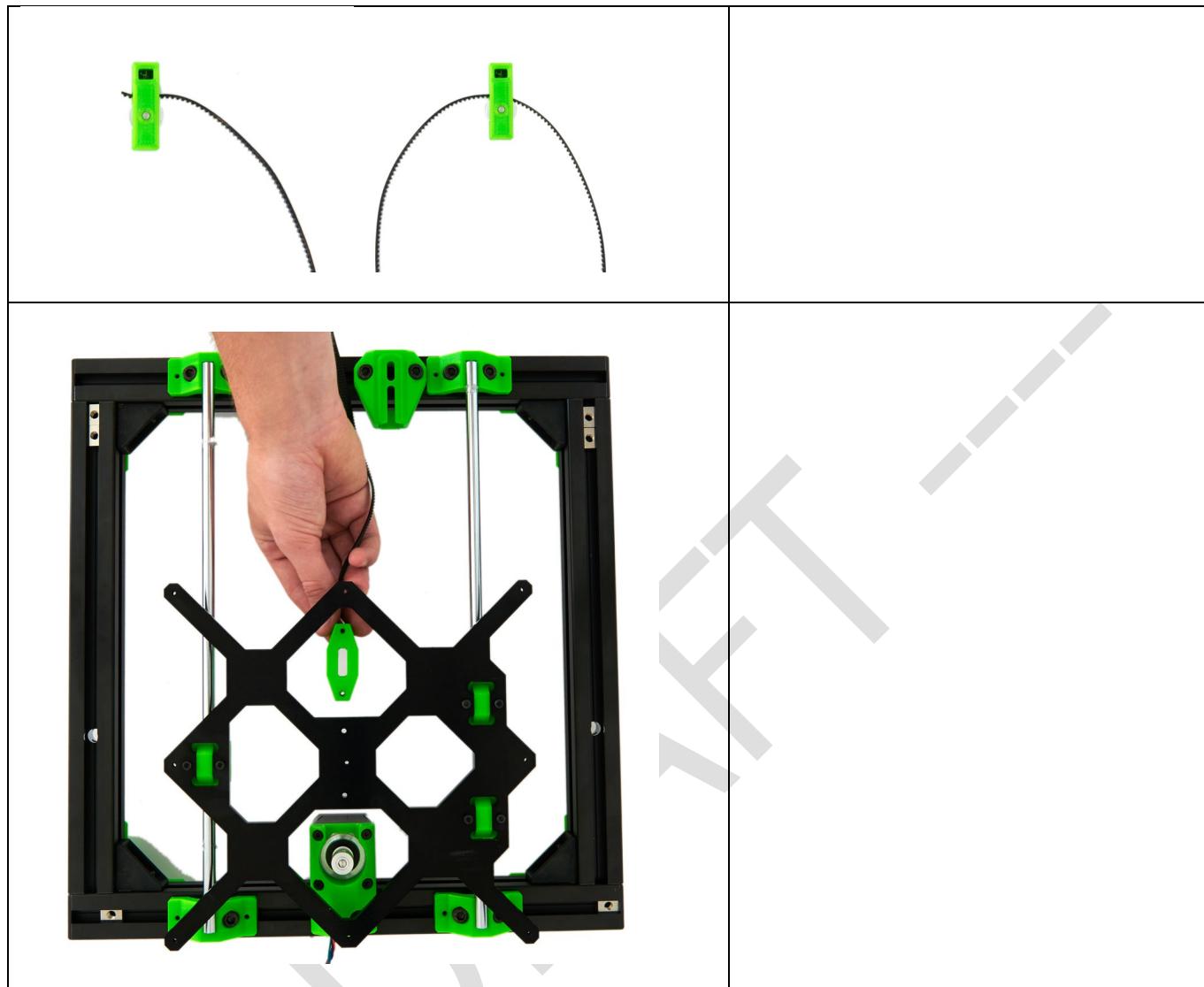
	<p>Attach the motor mount onto the motor, with the cables exiting towards the M6 holes on the back (don't get confused by the picture). Use four M3 washers and M3x10mm screws to attach the mount to the motor.</p>
	<p>Slide the toothed GT3 pulley onto the motor shaft. The pulley has two fastening screws, make sure one of them is aligned with the flat surface of the shaft.</p> <p>Leave a thin gap between the pulley and the motor face, as to avoid rubbing.</p>
	<p>Now attach the motor assembly to the rear extrusion, with the motor on the inner side of the frame. Use two M6x12mm screws and the two T-nuts that we inserted into the extrusion in chapter 1.</p> <p>Leave these lightly loose as we will adjust the position of the motor along the extrusion later.</p>

#### 4.2.4 XY-IDLER (TENSIONER) ASSEMBLY

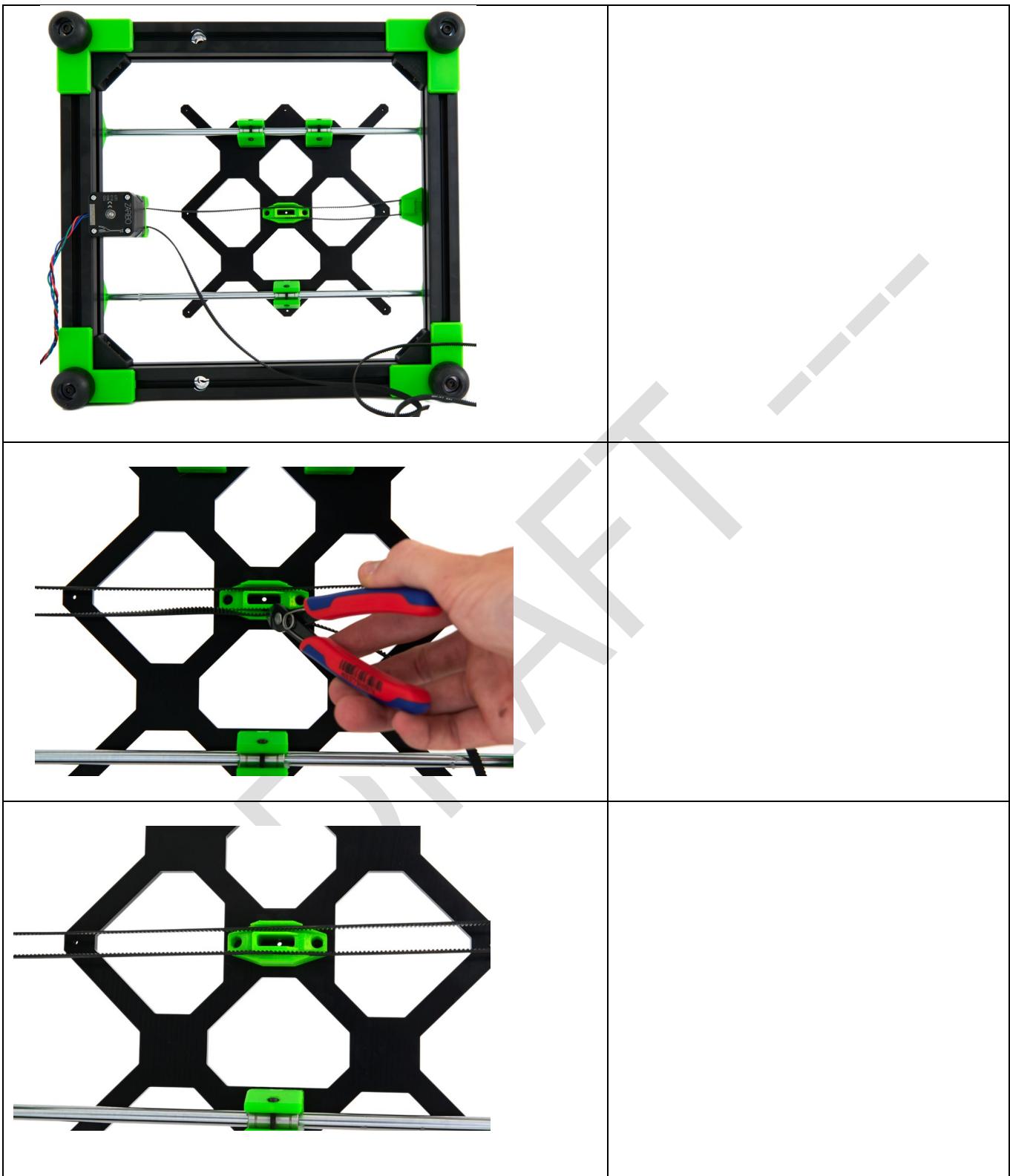
		<p>Take the xy-belt tensioner and insert the dowel pin until you can see about half a millimeter of the pin inside the tensioner. In case of difficulty use a sharp knife to increase the diameter of the hole a bit.</p>
		<p>Now put a plastic washer on the dowel pin and insert the toothless pulley. Push the dowel further until it reaches the end of the pulley.</p>
		<p>Insert a second plastic washer and push the dowel pin all the way through the tensioner insert.</p> <p><b>CAUTION:</b> Don't use too much force while pushing the dowel this may break the plastic part.</p>
		Finally insert a Nyloc nut into the slot of the tensioner.

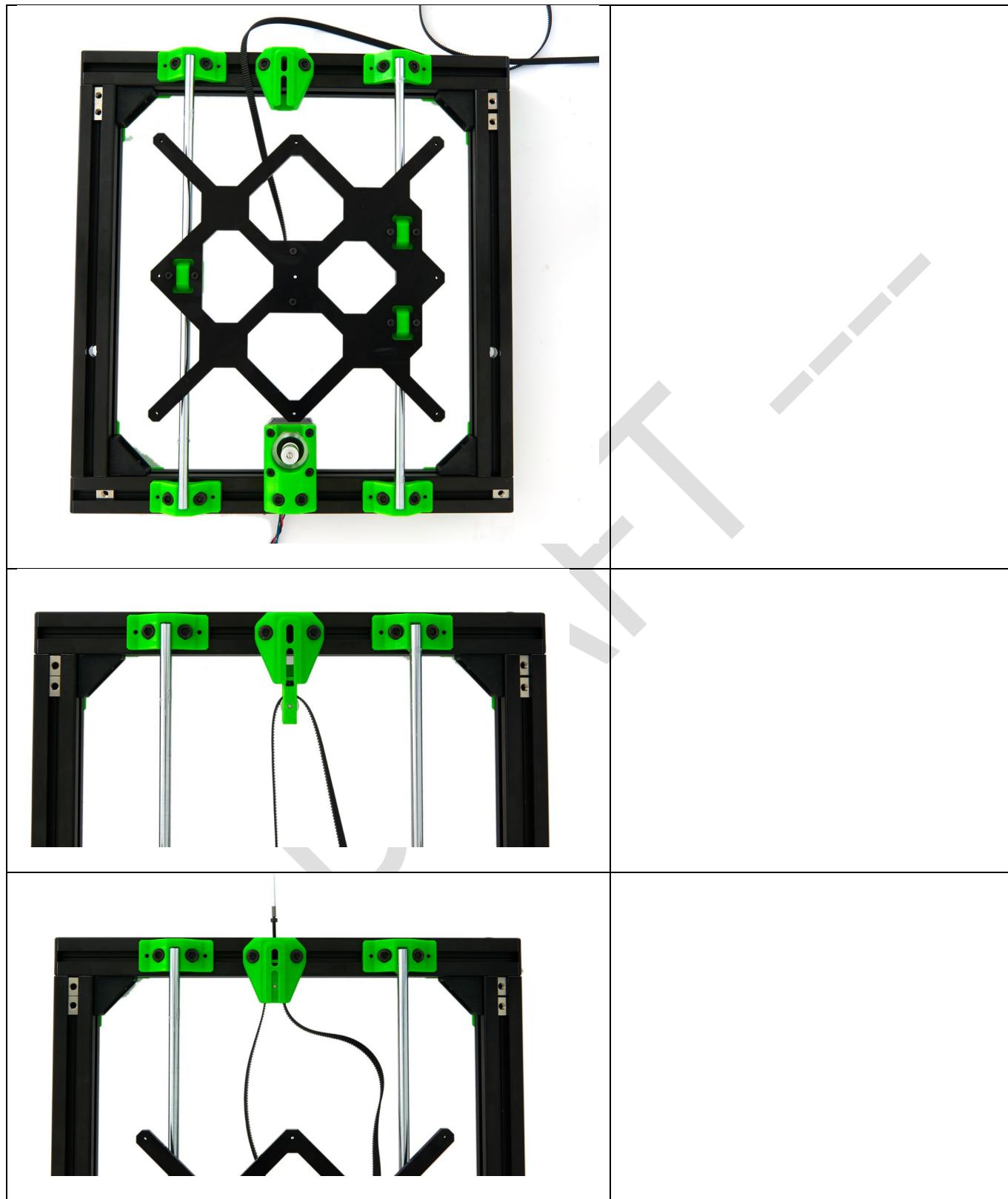
#### 4.2.5 Y-IDLER AND Y BELT INSTALLATION

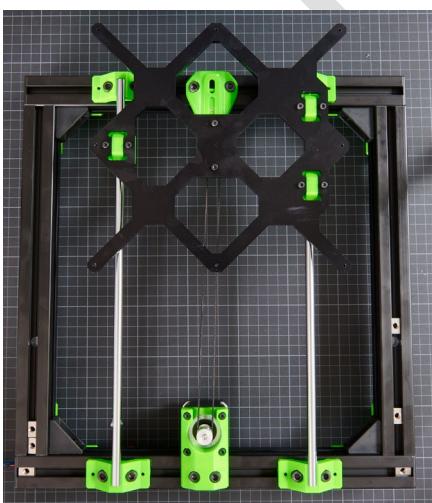
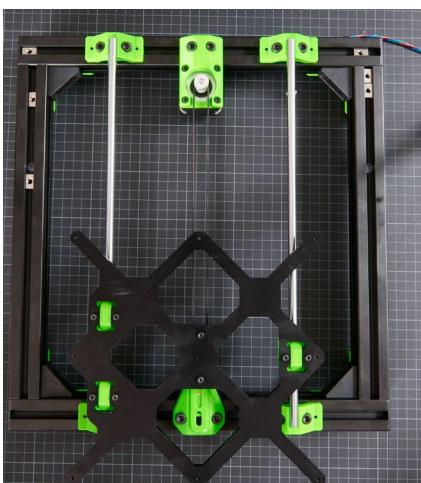
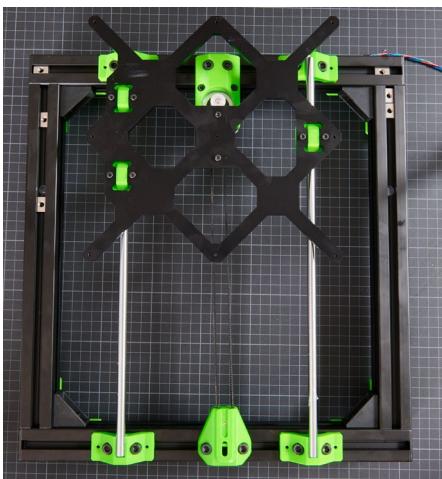




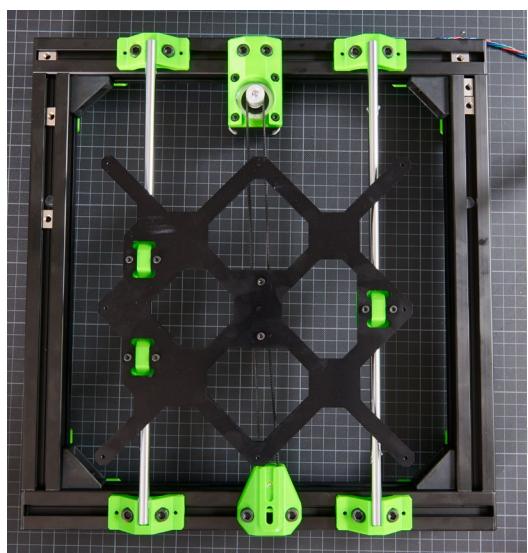


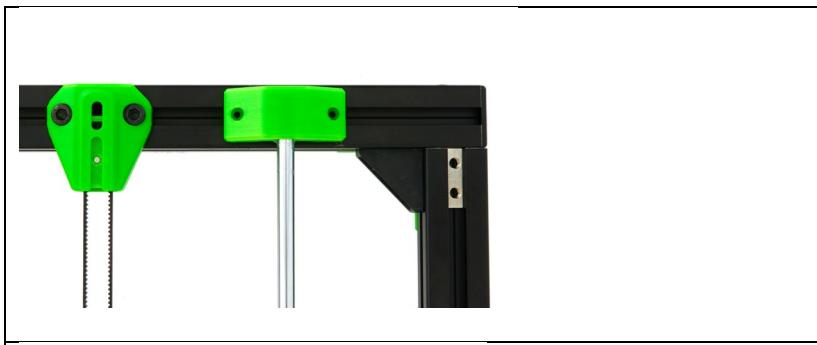






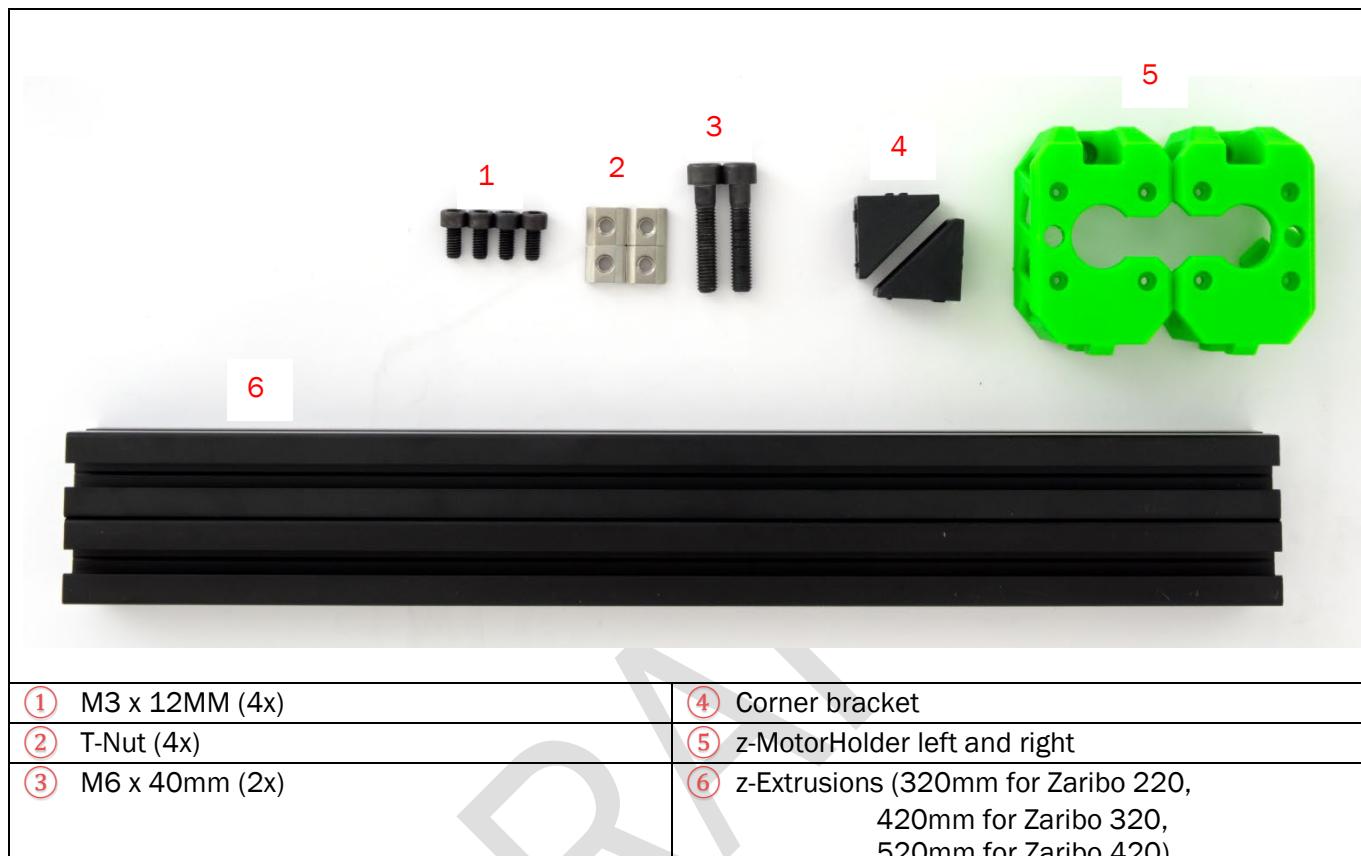


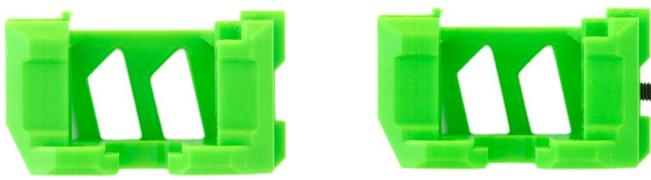
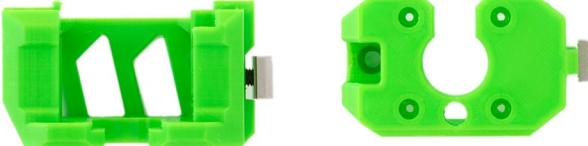
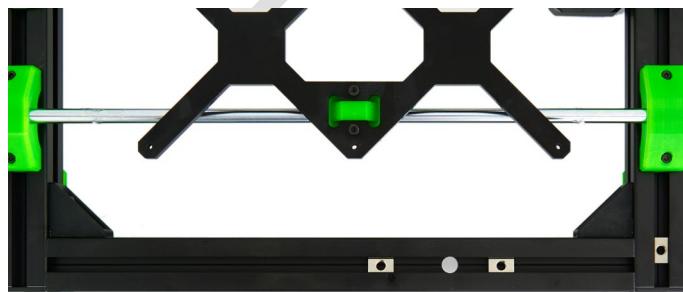


	Finally put on the covers on the y-rodholders.
	Fasten the covers with two M3 x 10mm screws. Be careful and screw with not too much pressure so that you don't push out the M3 nuts at the bottom.

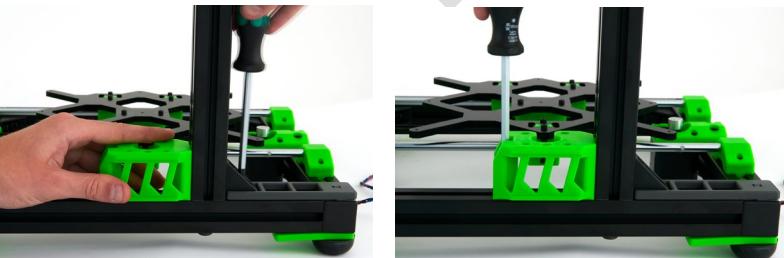
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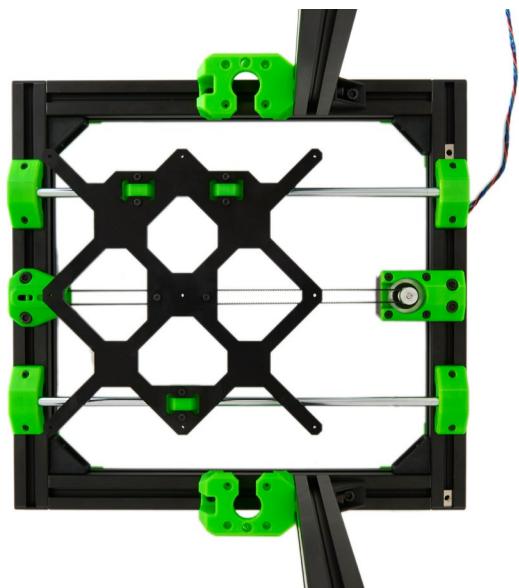
## 4.3 Z-AXIS ASSEMBLY



	<p>NOTE: you have to prepare <b>both</b> z-motor holders like this.</p> <p>Insert a M6 x 12mm screw to the back of the holder.</p>
	<p>Screw a T-nut on the M6 x 12mm screw.</p> <p>The right holder will look like this.</p> <p>Repeat the same preparation for the left z-motor holder.</p>
	<p>Prepare two corner brackets in the following way:</p> <p>Insert a M6 x 12mm screw to one of the holes of the bracket.</p>
	<p>Screw a T-nut on the M6 x 12mm screw.</p> <p>Top and side view of the bracket.</p>
	<p>Now continue with the xy-frame that was assembled so far.</p> <p>Make sure one of the T-nuts is in front side of the hole for the z-axis and one is on the back side!</p>

	<p>Place the z-Extrusions over the hole and fasten from below with a M8 x 40mm screw. Only tighten loosely!!</p>
	<p>Slide the right z-motor holder and a corner bracket into the extrusion slot (T-nut goes into the slot). Push both to the bottom of the extrusion so that they sit on the xy-frame.</p>
	<p>Make sure the corner bracket and the motor holder sit flush in the xy frame and fasten the M6 x 12mm screws that are attached to the T-nuts.</p>

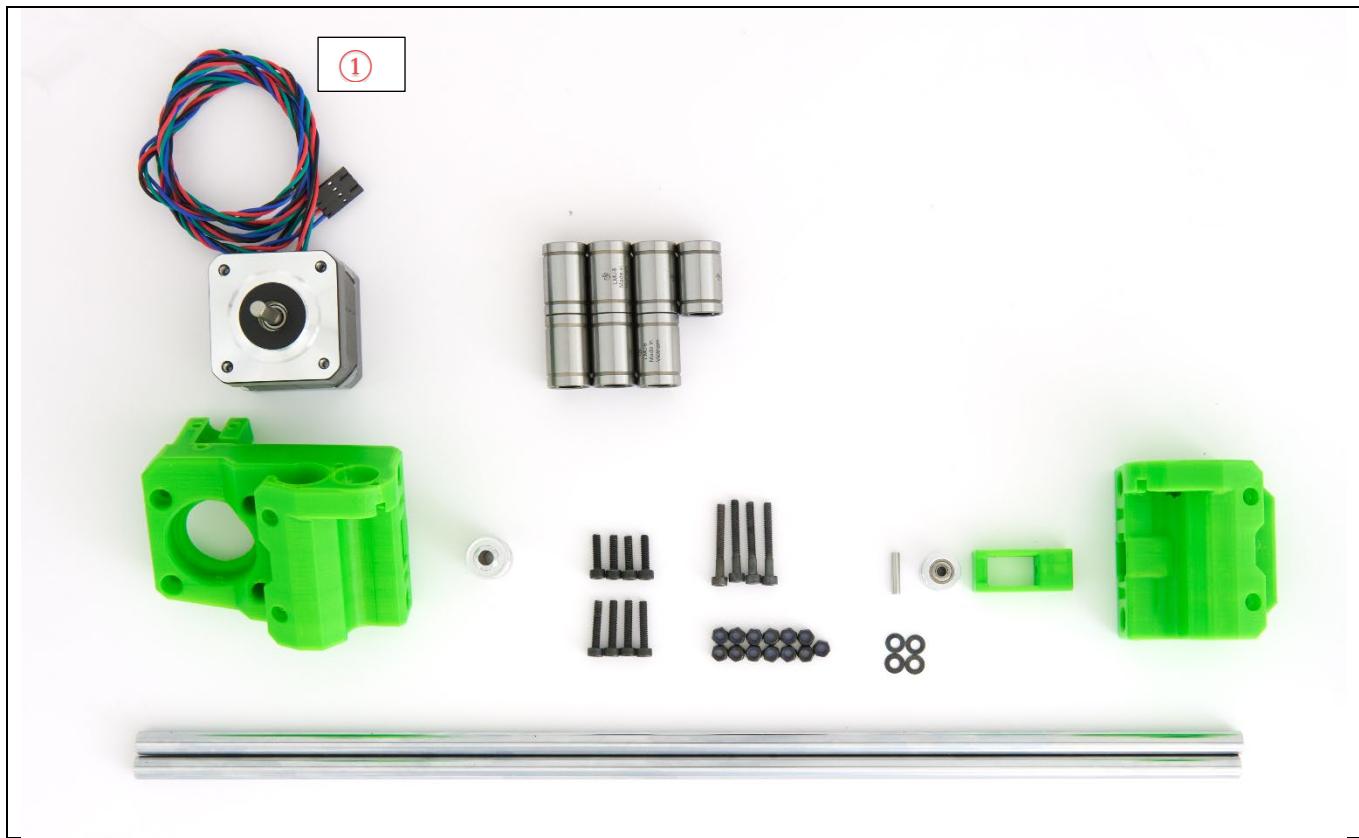
	<p>Make sure the T-nuts in the xy-frame sit under the hole of the motor holder and under the corner bracket.</p> <p>Take two M6 x 12mm screws and screw them into the motor holder and the T-nut below. Do the same for the corner bracket.</p> <p>Don't tighten the screws yet. You should still be able to move the y-extrusion back and forth by about 1mm.</p>
	<p>Now comes another important step in order to get a square frame. It need to be ensured that that both z-axis have the same distance to the back.</p> <p>Use the z-alignment tool and slide it into the x-extrusions on the back. Press the z-extrusion to the back so that it touches the alignment tool.</p>
	<p>Fasten the corner bracket with a M6 x 12mm screw.</p> <p>Fasten the front side of the motor with a M6 x 12mm screw.</p> <p>Make sure the z-extrusion side flush with y-extrusion on the side.</p> <p>Fasten the M6 x 40mm of the z-extrusion.</p> <p>Repeat the above steps for the other side of the frame.</p>



After completing the motor and z-axis assembly your frame should look like this.

In the last step the two z-motors are attached.

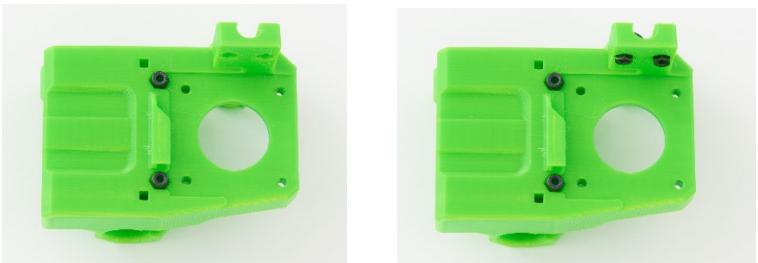
## 4.4 X-AXIS ASSEMBLY

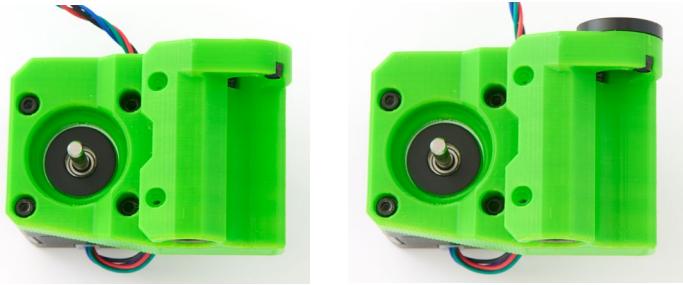


① Stepper Motor	⑧ Dowel pin (1x)
② Bearings (7x)	⑨ M3 washer (5x)
③ X-Motor holder	⑩ Toothless pulley (1x)
④ GT3 toothed pulley	⑪ xy BeltTensioner (1x)
⑤ z-MotorHolder left and right	⑫ x-Idler
⑥ z-Extrusions	⑬ smooth rods 370mm (2x)
⑦ z-Extrusions	

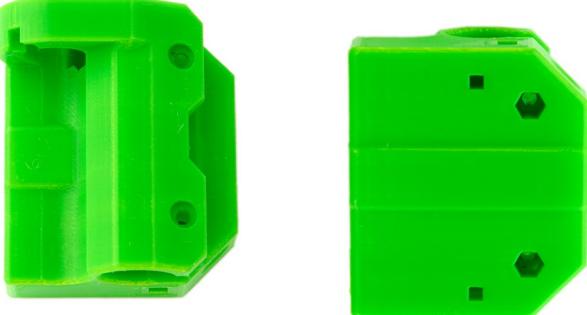


## 4.4.1 X-MOTORHOLDER ASSEMBLY

	<p>Insert <b>2 M3 self securing nuts</b> on the back of the x-MotorHolder.</p> <p>Insert two <b>M3 hex nuts</b> at the top for the motor holder cover.</p>
	<p>Use a screwdriver to push in the self-securing nuts.</p> <p>Use a plier to push in the hex nuts. As an alternative use a <b>M3 x 10mm head cap screw</b> to pull in the hex nuts in to the holder.</p>
	<p>Place one stepper motor on the back of the holder and make sure that the cables runs through the cable holder</p> <p>Turn the motor holder around and insert <b>M3 washers</b> into the hole of the screws for the motor.</p>
	<p>Fasten the motor with <b>4 M3 x 12mm head cap screws</b>.</p> <p>Insert one bearing from the top and one from the bottom into the holder. Make sure to push them far enough so that they touch the stop in the middle in the holder.</p>

	<p>Insert <b>2 self securing nuts</b> into the slots close the hole for the POM nut.</p> <p>Insert the <b>POM nut</b>.</p>
	<p>Take <b>2 M3 washers</b> and <b>2 M3 x 14mm head cap screws</b> to fasten the POM. Don't tighten the screws yet. This will be done in a later step.</p> <p>Use <b>2 M3 x 25mm head cap screws</b> to fasten the bearings. Only tighten the screws until you feel that the screws grab on the self-securing nuts. Don't overtighten!</p>
	<p>Slide the toothed GT3 pulley onto the motor shaft. The pulley has two fastening screws, make sure one of them is aligned with the flat surface of the shaft.</p> <p>Leave a thin gap between the pulley and the motor face, as to avoid rubbing.</p> <p>The two pictures show the assembled motor holder.</p>

## 4.4.2 X-IDLER ASSEMBLY

	<p>Follow the same steps for the x-idler as for the x-motor holder:</p> <ul style="list-style-type: none"> <li>- Insert <b>2 M3 self securing nuts</b> on the back of the x-MotorHolder</li> <li>- Insert <b>2 self securing nuts</b> into the slots close the hole for the POM nut</li> <li>- Insert the <b>POM nut</b></li> <li>- Take <b>2 M3 washers</b> and <b>2 M3 x 14mm head cap screws</b> to fasten the POM. Don't tighten the screws yet. This will be done in a later step</li> <li>- Use <b>2 M3 x 25mm head cap screws</b> to fasten the bearings. Only tighten the screws until you feel that the screws grab on the self-securing nuts. Don't overtighten!</li> </ul>
	<p>Insert one M3 self securing nut at the top and one at the bottom of the idler</p>
	<p>View from the bottom of the assembled x-idler.</p>


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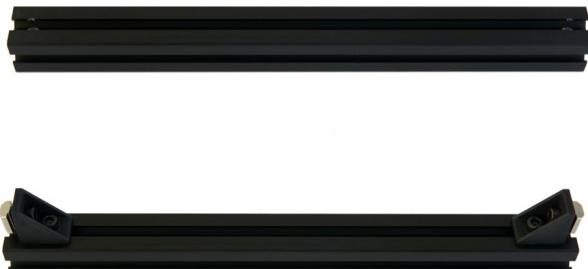

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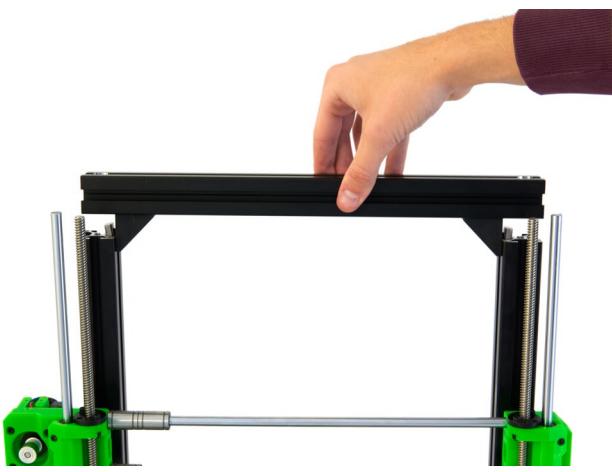
#### 4.4.3 XY-IDLER (TENSIONER) ASSEMBLY

		<p>Take the xy-belt tensioner and insert the dowel pin until you can see about half a millimeter of the pin inside the tensioner. In case of difficulty use a sharp knife to increase the diameter of the hole a bit.</p>
		<p>Now put a plastic washer on the dowel pin and insert the toothless pulley. Push the dowel further until it reaches the end of the pulley.</p> <p>Insert a second plastic washer and push the dowel pin all the way through the tensioner insert.</p>
		<p>CAUTION: Don't use too much force while pushing the dowel this may break the plastic part.</p>
		Finally insert a Nyloc nut into the slot of the tensioner.

## 4.5 Z-TOP AXIS ASSEMBLY

### 4.5.1 MOUNTING X-TOP-EXTRUSION

	<p>Prepare two corner brackets in the following way: Insert a M6 x 12mm screw to one of the holes of the bracket.</p>
	<p>Screw a T-nut on the M6 x 12mm screw. Top and side view of the bracket.</p>
	<p>Put the two corner brackets onto the X-extrusion, in the slot with the two smaller screw holes.</p>
	<p>Prepare the left and right z-top holder by putting in 2 M6 x 12mm screws from the front and screwing in 2 T-nuts from the back.</p>

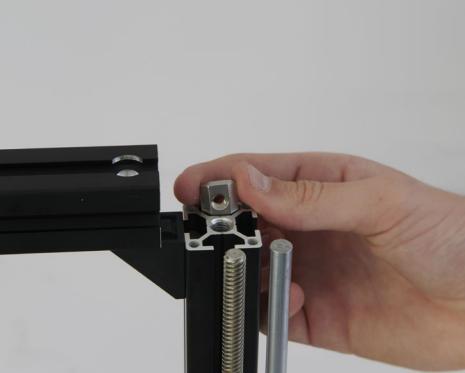
	<p>Put the X-extrusion onto the printer as seen in the picture, with the T-nuts of the corner brackets properly slotted into the inner slots of the z-extrusions.</p>
	<p>Screw in both M8x40mm screws into the top, and tighten them slightly.</p>
	<p>While pushing the corner brackets up against the x-extrusion, screw in the horizontal M6x12mm screws. Do this for both sides of the frame.</p>
	<p>Remove both M8x40mm screws in order to be able to slide the extrusion.</p>

	Slide the x-extrusion to the right.
	Insert 1 T-nut into the back slot of the left z-extrusion. (Needed to the Einsy box)
	Install the left top bracket, making sure the notch is properly inserted in the z-extrusion.
	You may use a hammer to VERY GENTLY slide the smooth rod into the top holder.  Please pay attention to the next picture!

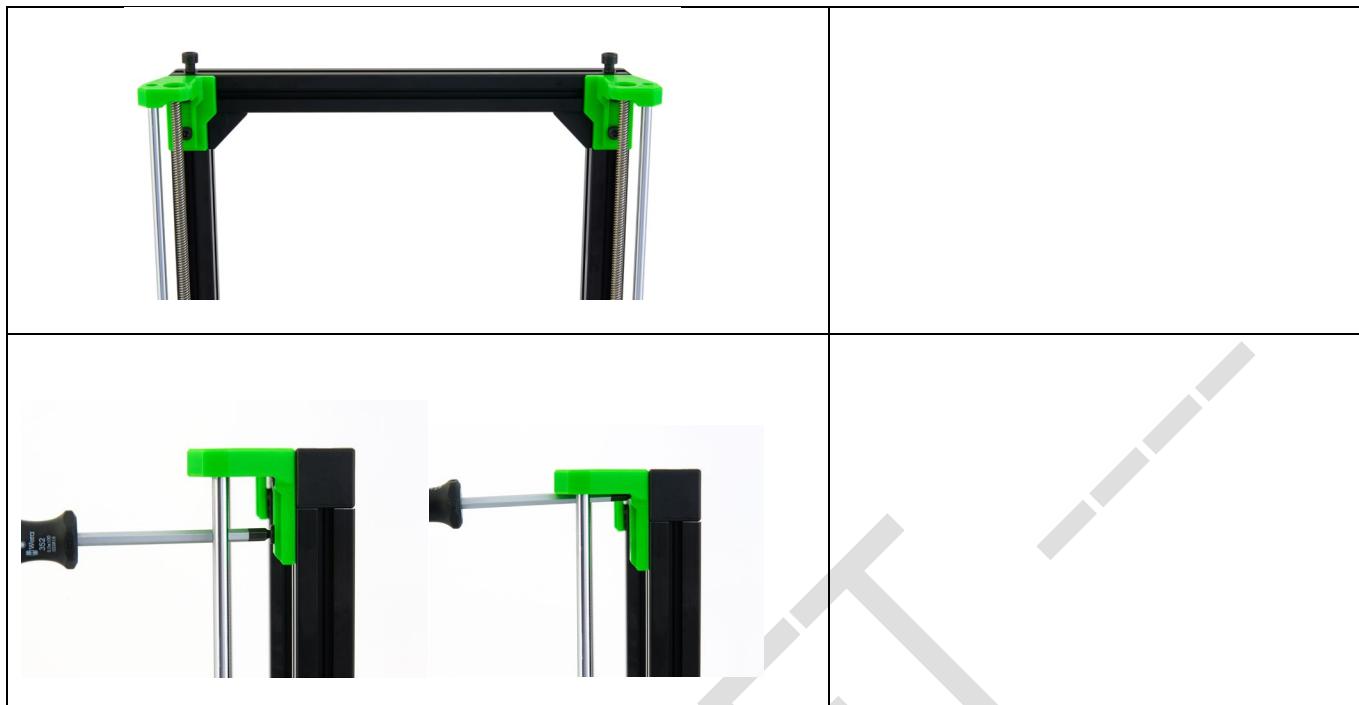


Gently adjust the height of height of the top bracket so that its upper notch is aligned with the extrusion slot of the X-extrusion.

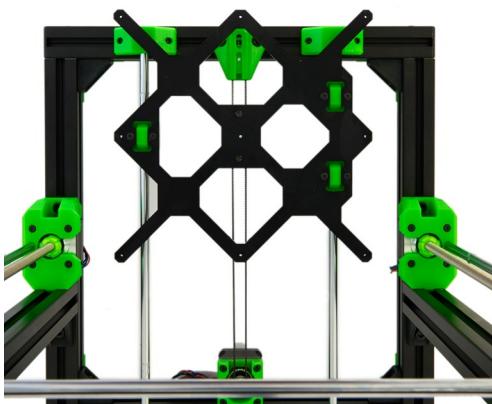


	<p>Insert one t-nut into the right extrusion slot (for PSU otp holder)</p> <p>Correct photo</p>
	
	

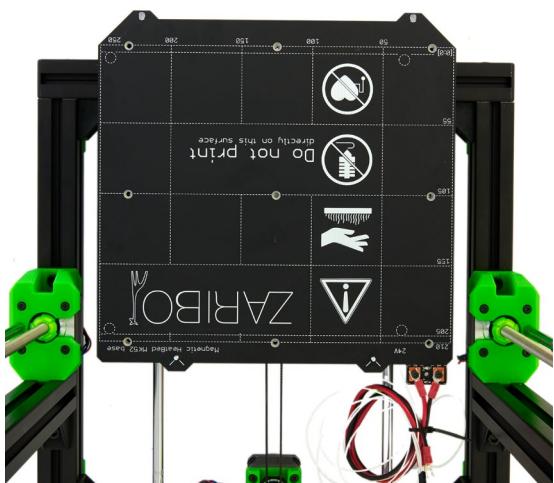




## 4.6 HEAT BED INSTALLATION

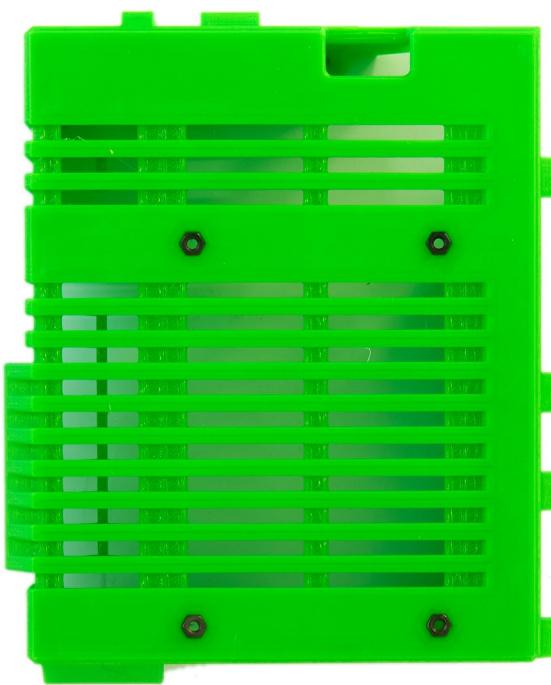


Using M6x12mm screws and T-nuts, prepare the four corner brackets as seen in the picture. Don't tighten them fully, the T-nut should have a generous amount of play (will be useful in the next step).



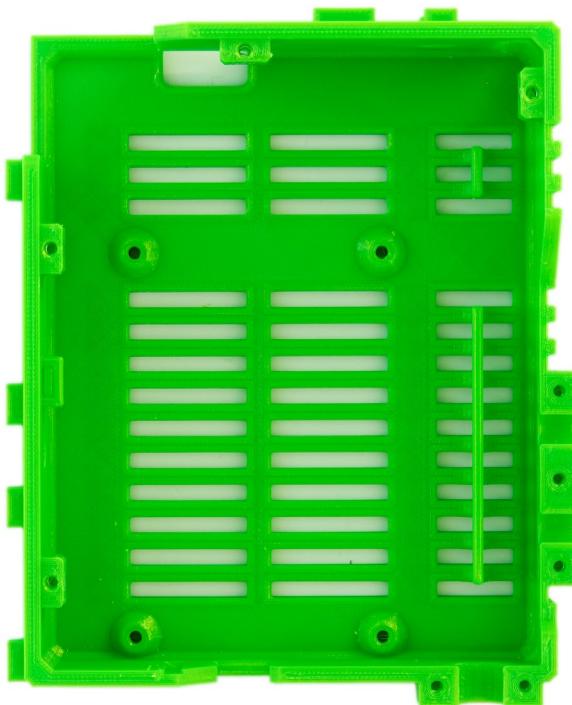


## 4.7 EINSY BOX ASSEMBLY

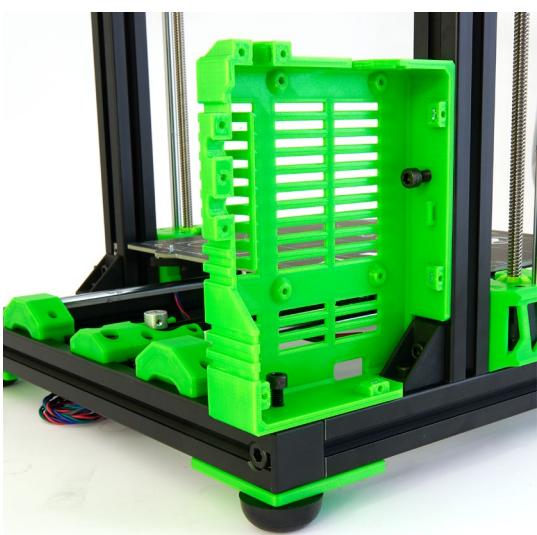


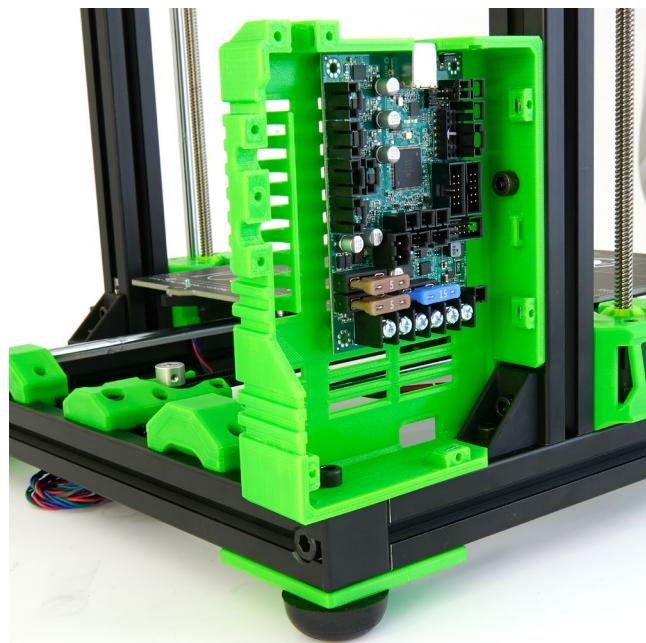
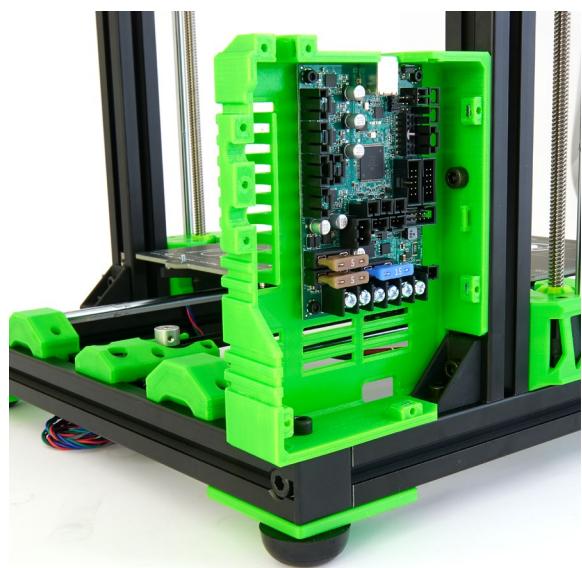
Preparation of the Einsky box:

Insert 4 M3 hex nut on the back of the Einsky box



Insert 9 square in the slots on the inside of the box.



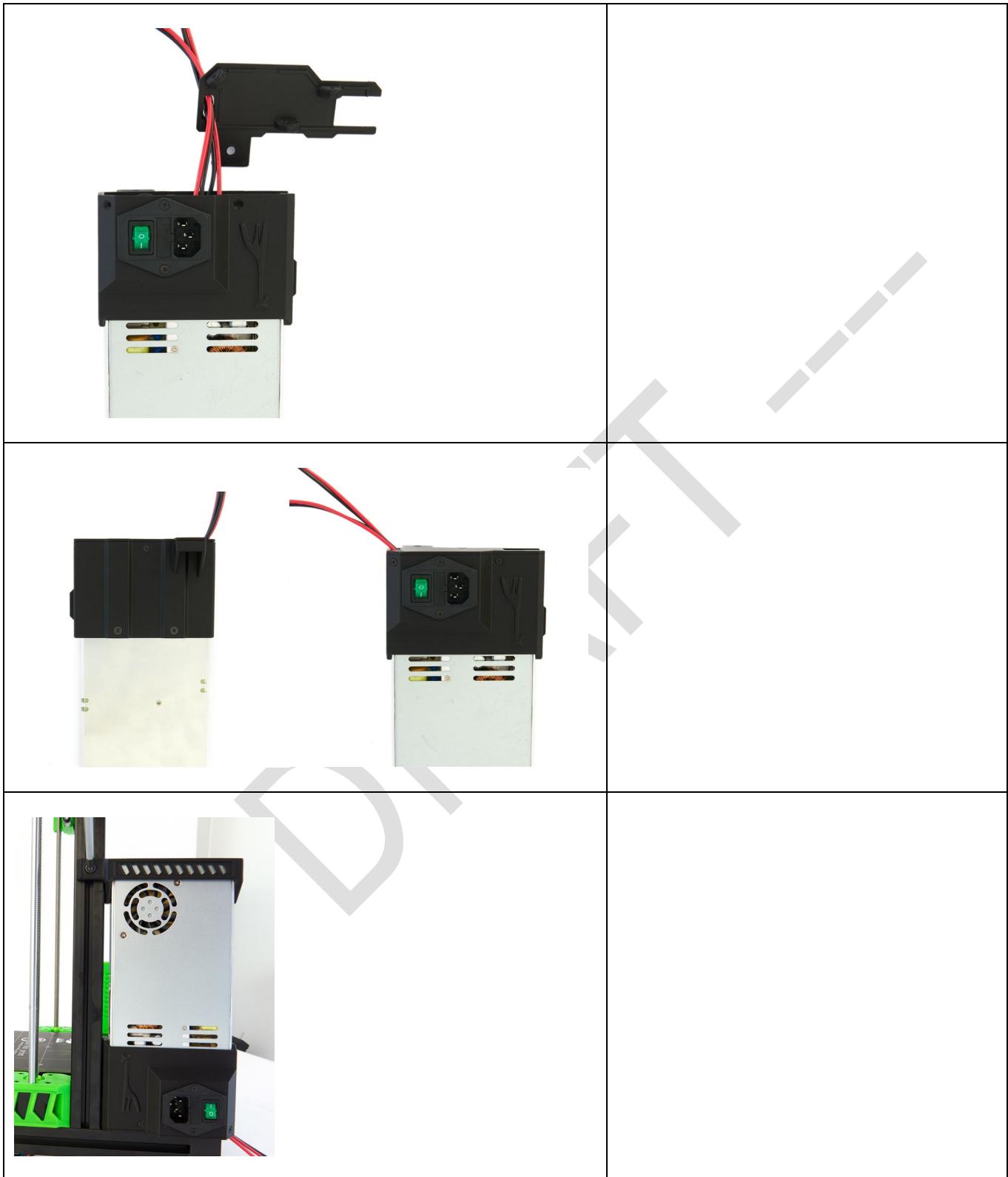


## 4.8 PSU ASSEMBLY

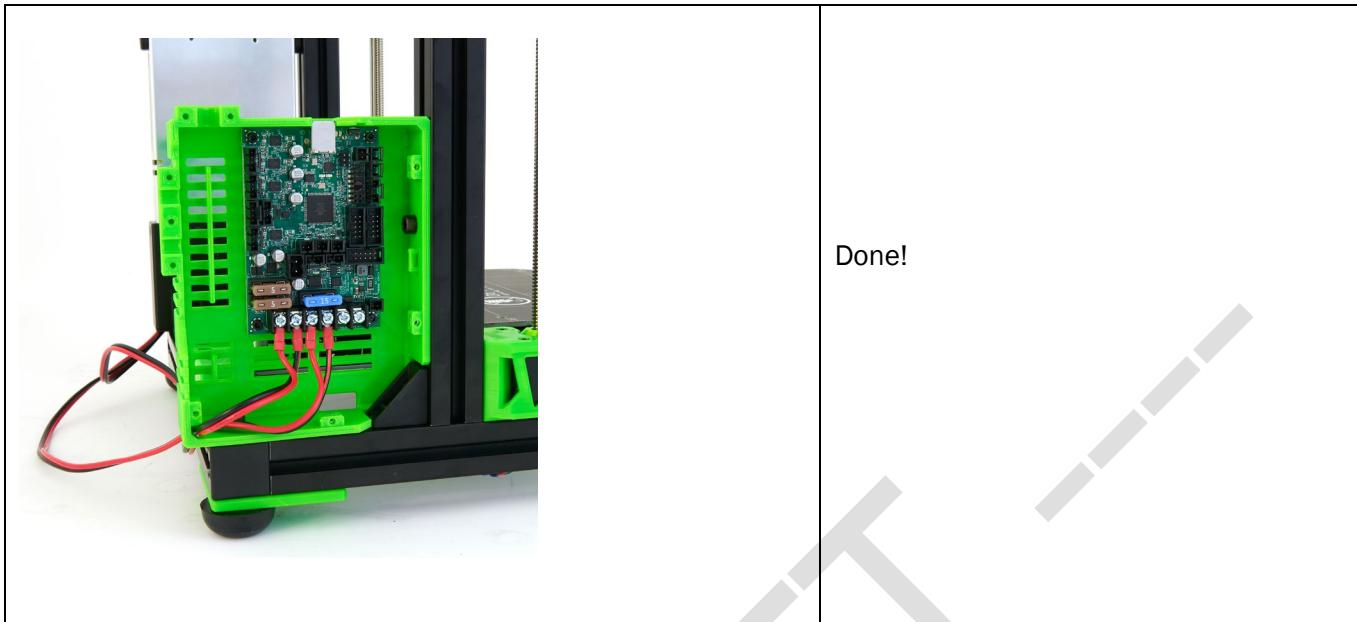
### 4.8.1 MEANWELL RSP-320









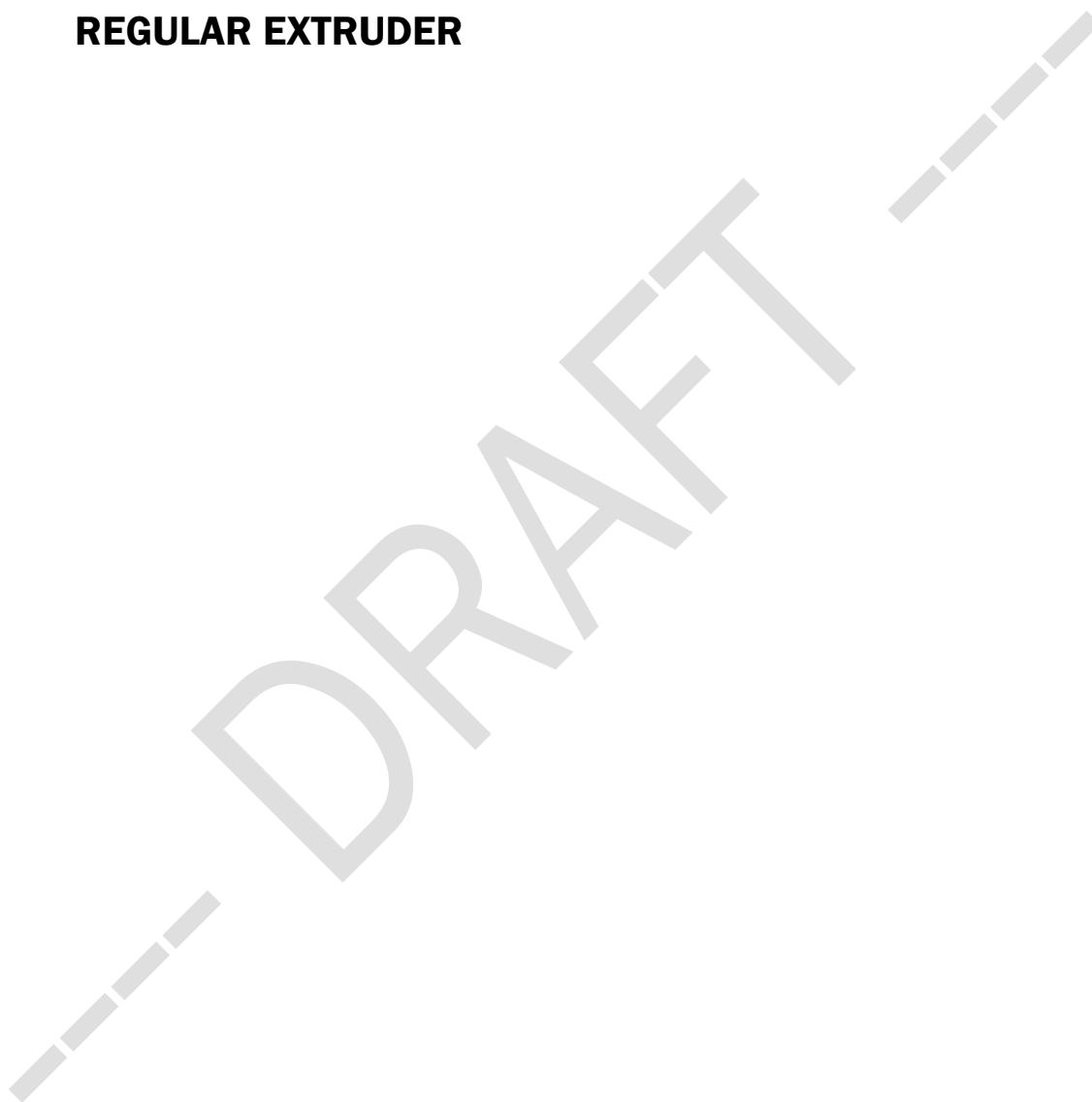


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## 4.9 EXTRUDER ASSEMBLY

### 4.9.1 BONDTECH EXTRUDER

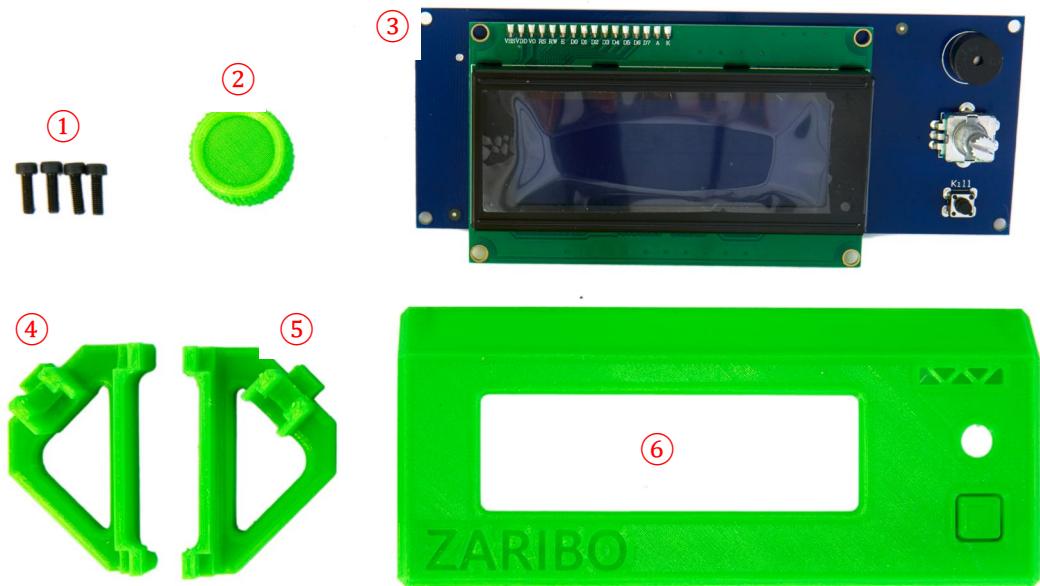
### 4.9.2 REGULAR EXTRUDER



## 4.10 EXTRUDER INSTALLATION



## 4.11 LCD ASSEMBLY



① M3 x 6mm (4x)	④ LCD-Mount left
② LCD-Knob	⑤ LCD-Mount right
③ LCD panel	⑥ LCD cover



Insert the LCD panel into the LCD cover



Place the LCD mounts onto the LCD panel. You may have to push them into the cover gently. Pay attention to the orientation. Mounts for attaching the LCD to the frame must point to the outside.



Place 4 M3 x 10m screws into the holes in the corner.



Tighten the screws gently.



Make sure that you hear a clicking sound when pressing the pin of the LCD and pressing the reset button.

	Put on the control button. While pressing the button on the pin press against the panel from behind.
	Carefully remove the plastic foil in front of the display.

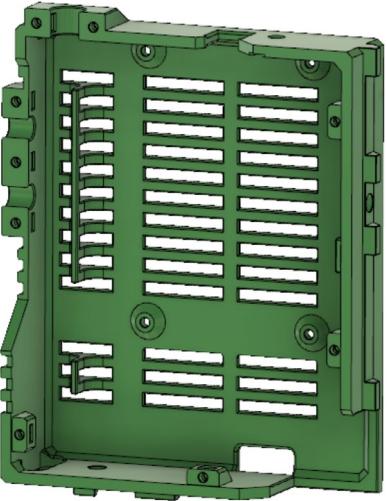
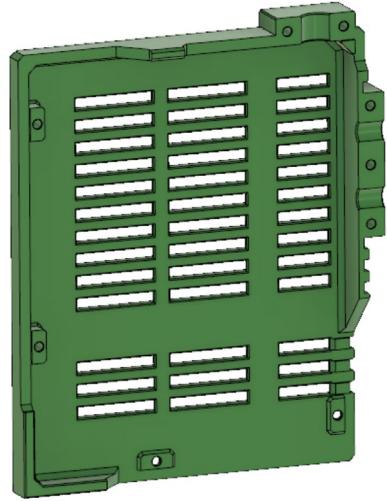
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# 5 OVERVIEW OF PLASTIC PARTS

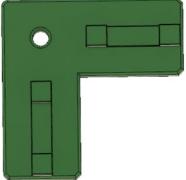
In this chapter we list all plastic parts of the release. On github <https://github.com/Zaribo/Zaribo-MK3> all STLs files (except Bondtech parts) are available in a corresponding directory structure

## 5.1 FRAME

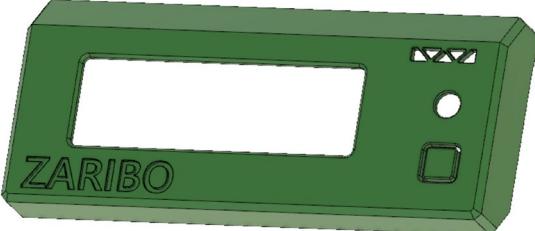
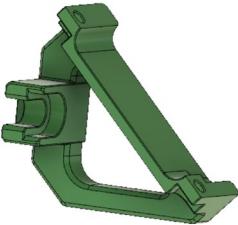
### 5.1.1 EINSY

	EinsyBox (1x)
	EinsyBoxCover (1x)

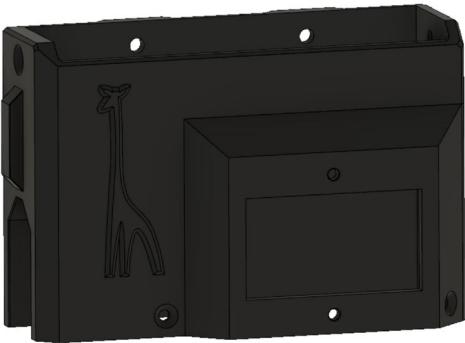
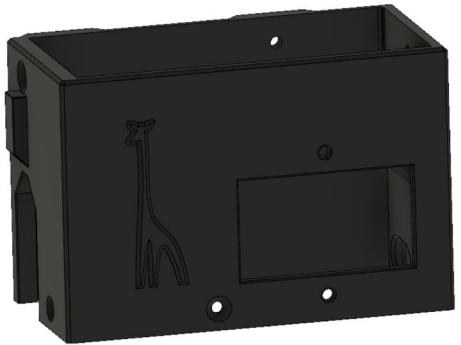
## 5.1.2 FRAME COMPONENTS

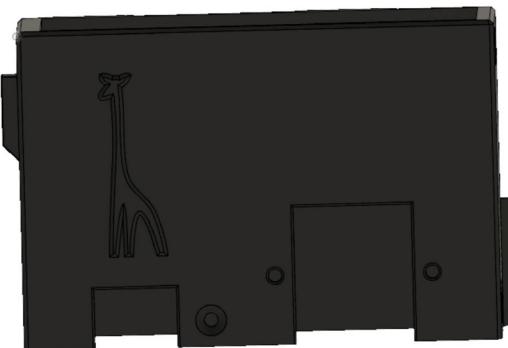
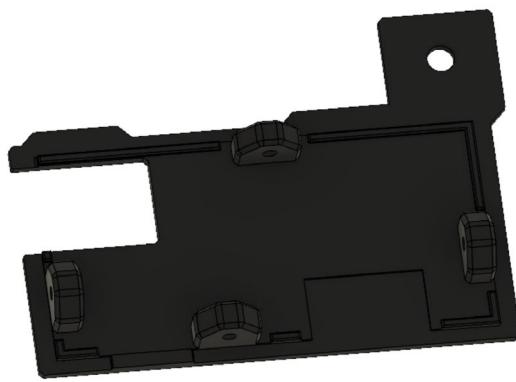
	L-Bracket (4x)
	ExtrusionCableClip (4x)
	ExtrusionSlotCover (optional)

## 5.1.3 LCD

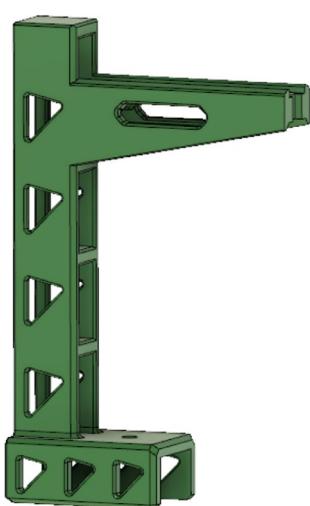
	LCD-Cover (1x)
 	LCD-Mount left (1x) LCD-Mount right (1x)
	LCD-Knob (1x)

## 5.1.4 PSU (MEANWELL, PRUSA)

	Meanwell PSU Cover
	Meanwell PSU Cover Bottom
	Meanwell PSU TopMount
	PSU-Cover (OneHole)
	PSU Cover Bottom (OneHole)
	PSU TopMount (for OneHole and TwoHole)

	PSU-Cover (TwoHole)
	PSU Cover Bottom (TwoHole)

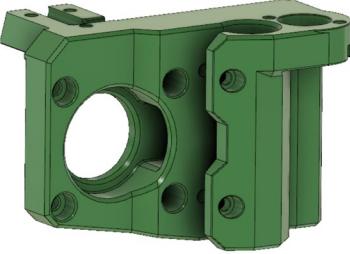
## 5.1.5 SPPOOLHOLDER

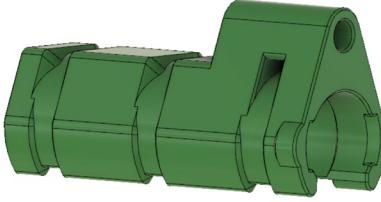
	SpoolholderBody (1x)
	SpoolholderEndCap (1x)

## 5.2 TOOLS

	y-AlignmentTool (1x)
	z-AlignmentTool (1x)
	LubelInjector-8mm (1x)
	LubelInjectorCap-8mm (1x)

## 5.3 X-AXIS

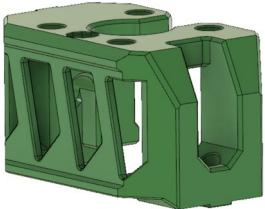
	x-MotorHolder (1x)
	x-MotorHolderCover (1x)
	x-Idler (1x)
	xy-BeltTensionerInsert (1x)
	X-Carriage (1x)

	X-CarriageCoverTop (1x)
	X-CarriageCoverBottom (1x)
	x-CableHolder (1x)

## 5.4 Y-AXIS

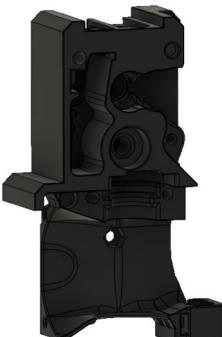
	y-RodHolderBottom (4x)
	y-RodHolderTop (4x)
	y-BearingHolder (1x)
	y-MotorHolder (1x)
	y-BeltHolder (1x)
	y-BeltTensioner (y-Idler) (1x)
	xy-BeltTensionerInsert (1x) (same part as on x-axis)

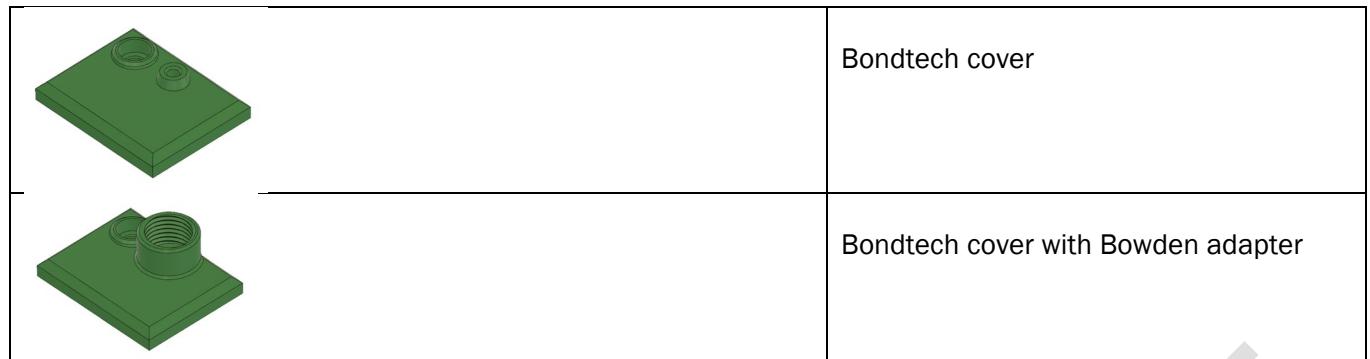
## 5.5 Z-AXIS

	z-MotorMount left
	z-MotorMount right
	z-TopMount left
	z-TopMount right

## 5.6 EXTRUDER

### 5.6.1 BONDTECH EXTRUDER

	Bondtech extruder body
	Bondtech extruder cove
	Bondtech radial fan holder
	Bondtech fan shroud



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