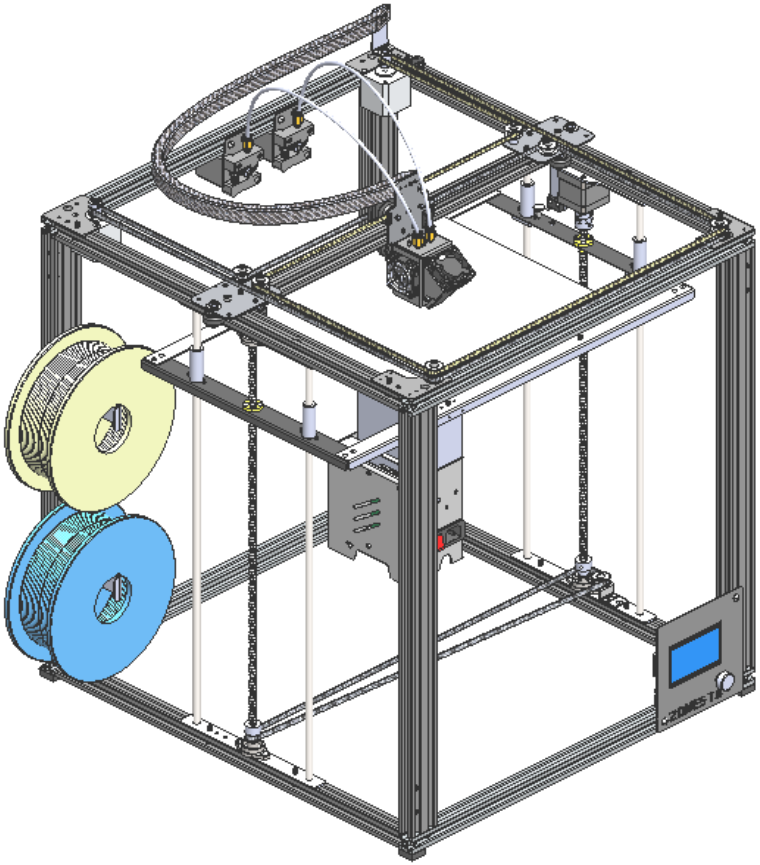
ZONESTAR



Model: Z9 Serial 3rd Version

User Manual

!! ATTENTION !!

Please strictly follow the standard operation when installation.

Please put the printer away from the reach of kids.

Must be guided by adults when children are installed or used.

Take care when installation, to avoid electrical shock hazards.

Caution: Hot!
Hotend has high temperature even the printer stop working.

Caution: Hot!
Hotbed has high temperature even the printer stop working.

Please keep well-ventilated condition! May produce toxic gases when printer working.

Please make sure you have set the AC power select switch to the correct position before power on.

For mixing color printer, must load filament to both of the extruders, even if you print single color 3D object.

Parts

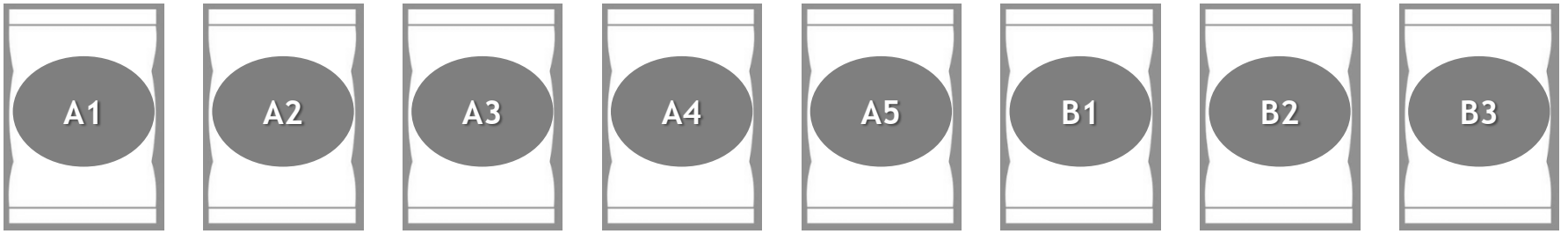


Fig	Name	Description
A1	Wires	1. LCD cable x1 2. Motor wire (Z9M2/Z9R2 = 5, Z9M3/Z9R3 =6, Z9M4/Z9R4 = 7)
A2	Drag chain parts	1. 0.8m 2. Metal Bracket x1 and screws
A3	Metal brackets	1. X-axis motor bracket 2. Y-axis motor bracket(with ENDSTOP) 3. Filament roll dock
A4	SD card & Gift	User guide stored in SD card
A5	Proximity sensor	Proximity sensor for bed auto leveling
B1	Tools	Tools for DIY assembled
B2	Screws	Screws for assembled
B3	Other parts	1. Closed timing belt for Z-axis synchronize 2. Open timing belt for X and Y axis 3. Timing pulley for X,Y and Z-axis 4. Filament guide tubes and fittings 5. Cable ties 6. Rubber Pads

Parts

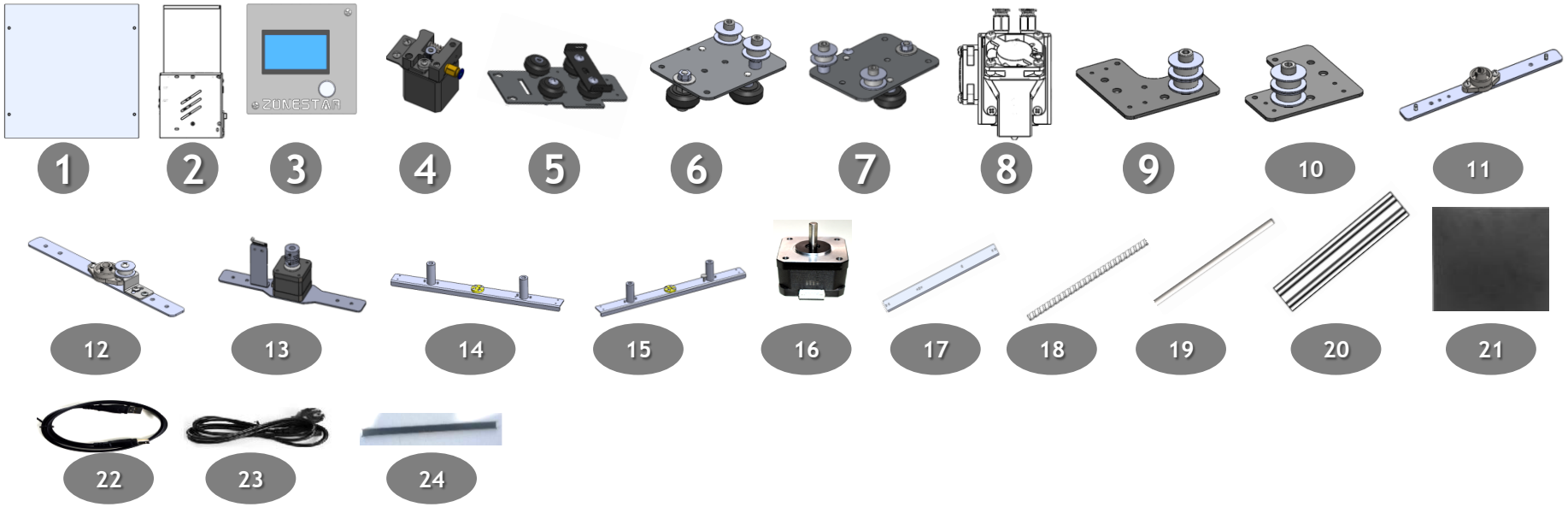
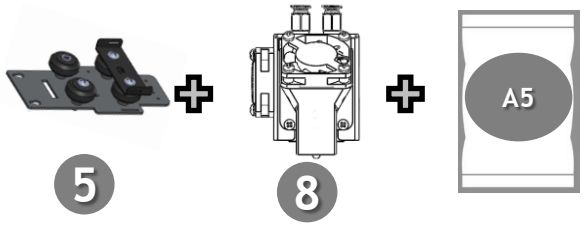


Fig	Name	Qty.
1	Hot Bed	1 PC
2	Control box	1 Set
3	Control Panel	1 Set
4	Extrusion feeder	2/3/4(*)
5	X Carrier	1 Set
6	Y Carrier -left	1 Set
7	Y Carrier-right (with a screw on the top)	1 Set
8	Hotend	1 Set
9	belt bracket - left	1 Set
10	belt bracket - right	1 Set
11	Left Z slider-rod bracket	2 Set
12	Right Z slider-rod bracket bottom	1 Set

Fig	Name	Qty.
13	Z axis drive componen	1 Set
14	Z-axis left slider	1 Set
15	Z-axis right slider (**with a hand screw**)	1 Set
16	Stepper Motor for X and Y	2 PCS
17	Hotbed bracket	2 PCS
18	T8 lead screw	2 PCS
19	slider rod	4 PCS
20	Aluminum profile	13 PCS
21	Hotbed film	1 PC
22	USB Cable	1 PC
23	Power cord	1 PC
24	*Profile cover*	1 PC

Assemble hotend module



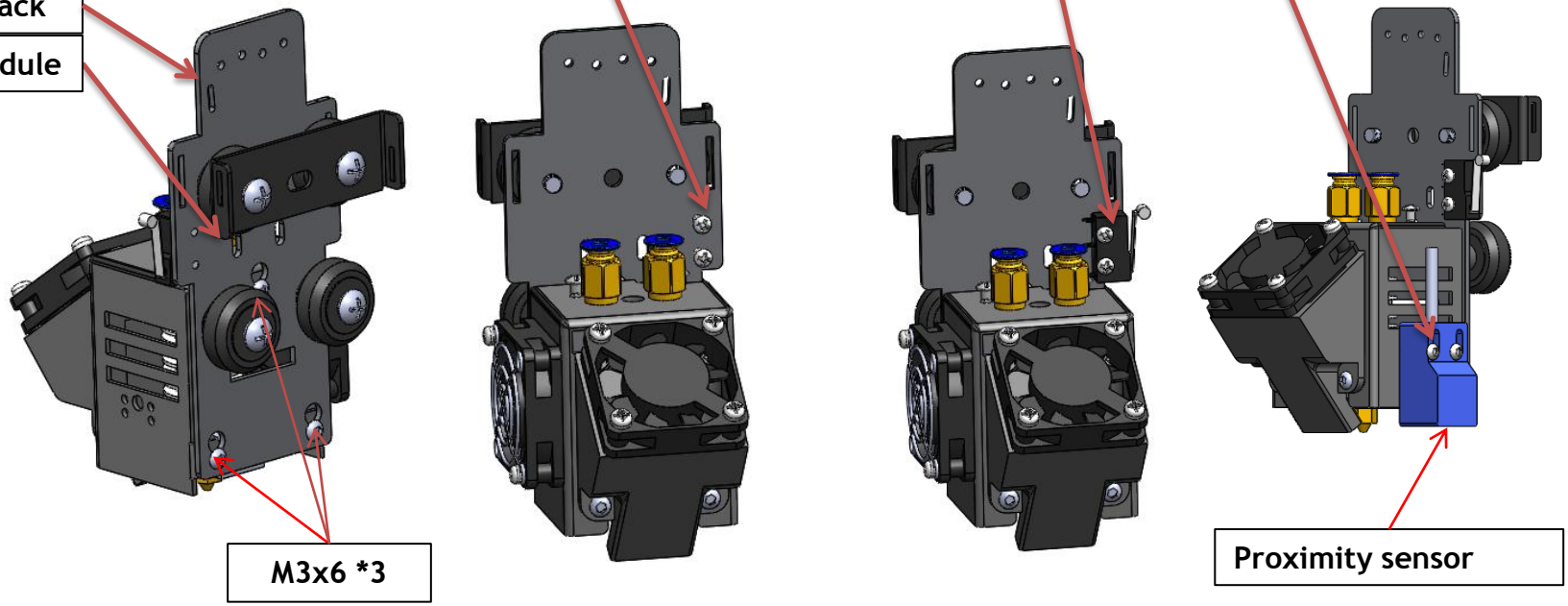
Hotend_back

Hotend module

Disassemble these two screws

Install X endstop

PM3x20



1. Install hotend module to the bracket
2. Disassemble X ENDSTOP fixed screws
3. Tighten the screws to install the X ENDSTOP
4. Install proximity sensor (see NOTE2)

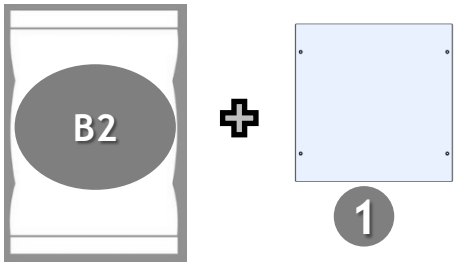
NOTE:

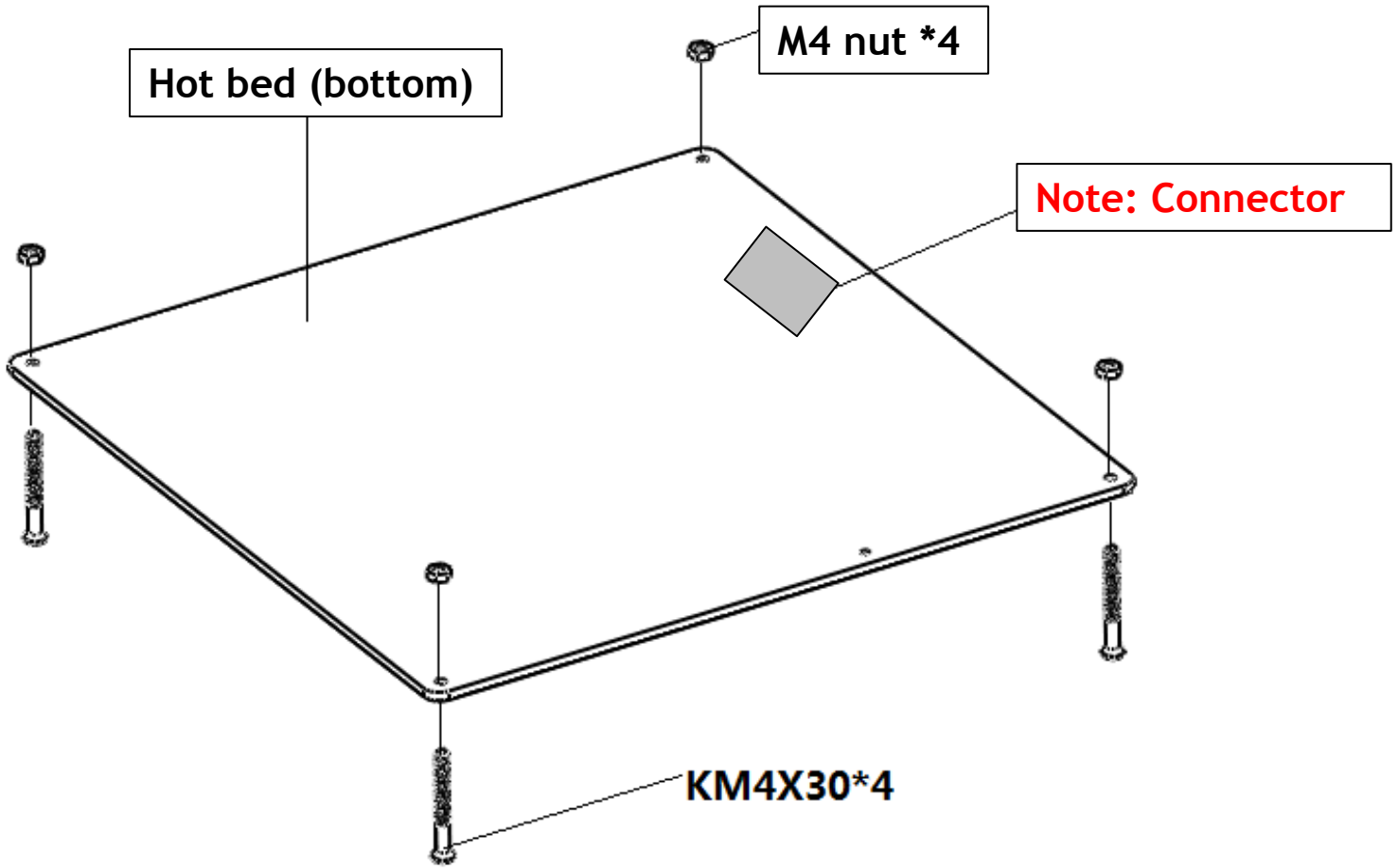
1. The installation mothed is the same for Z9M3 and Z9M3.

2. Don't install the proximity sensor in this step, about the detail, please refer the guide of "*Auto leveling feature user guide (PL-08N)*"

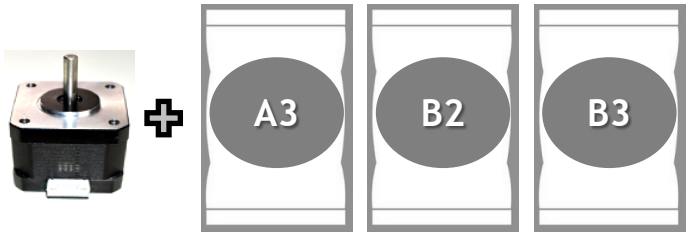
ZONESTAR

Assemble hot bed

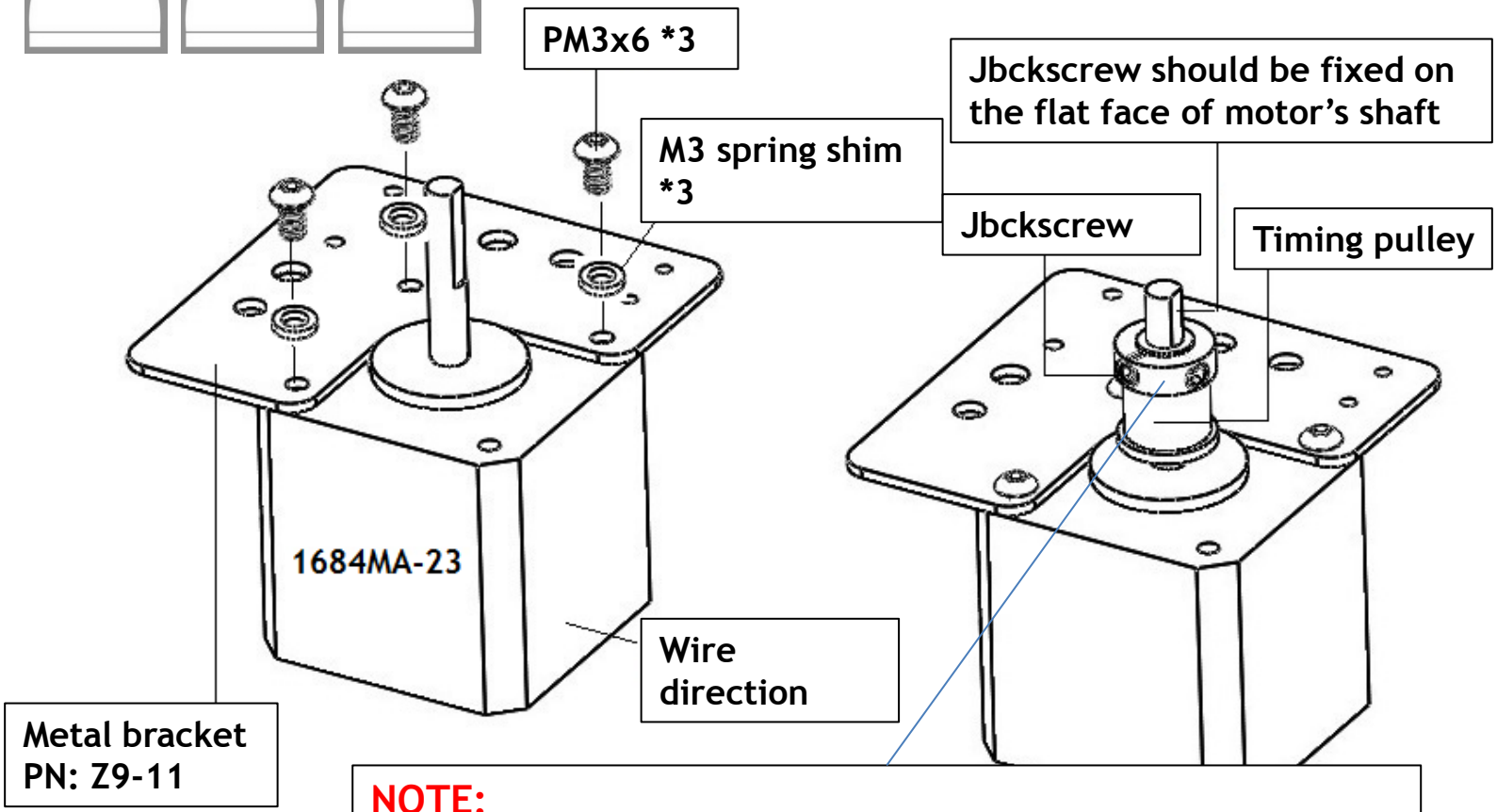




Assemble X drive components

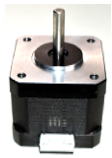


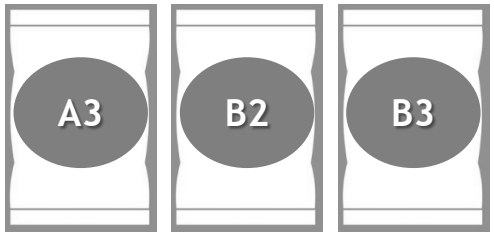
NOTE: Inner diameter is 5mm



NOTE:
1. Timing pulley's inner diameter is 5mm.
2. The platform of the timing pulley is on the top.

Assemble Y drive components





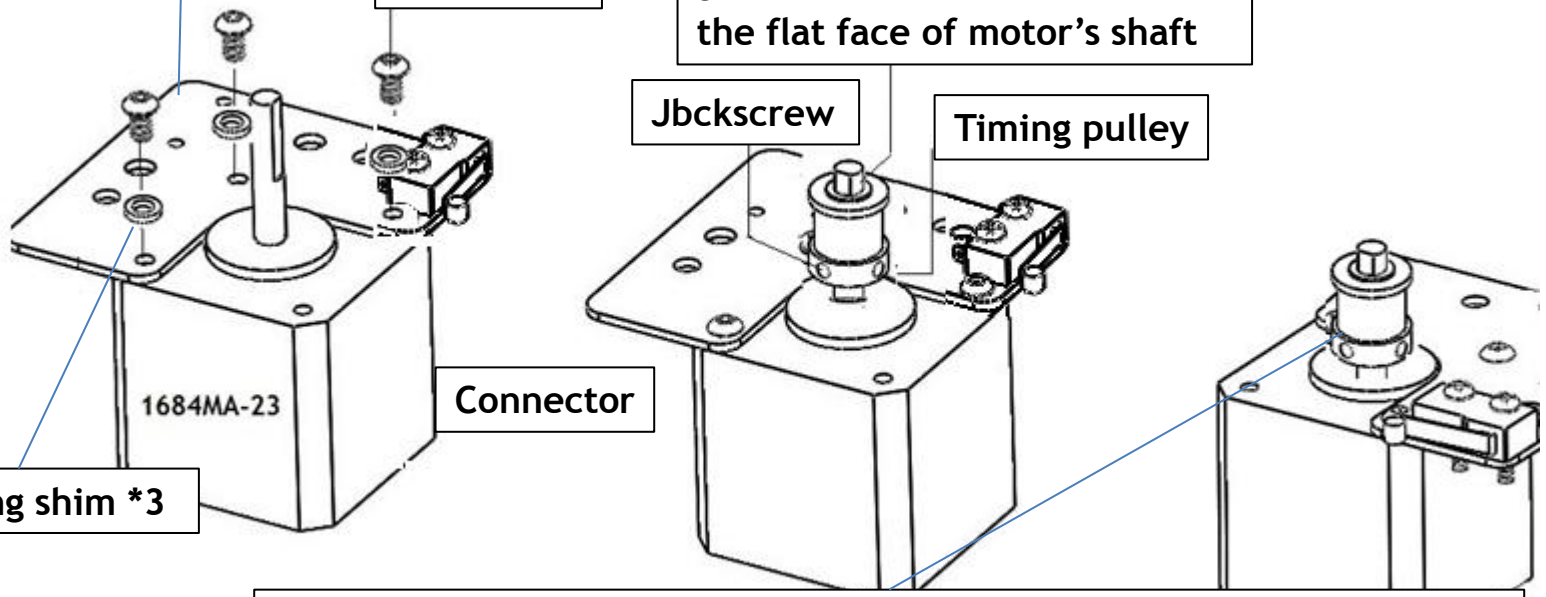
Metal bracket
PN: Z9-11

PM3x6 *3

Jbckscrew should be fixed on the flat face of motor's shaft

Jbckscrew

Timing pulley



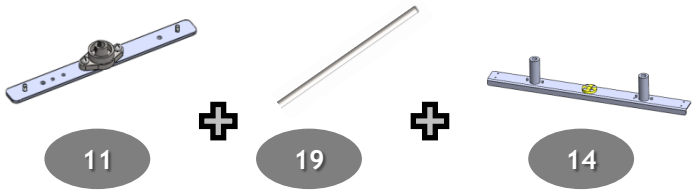
Connector

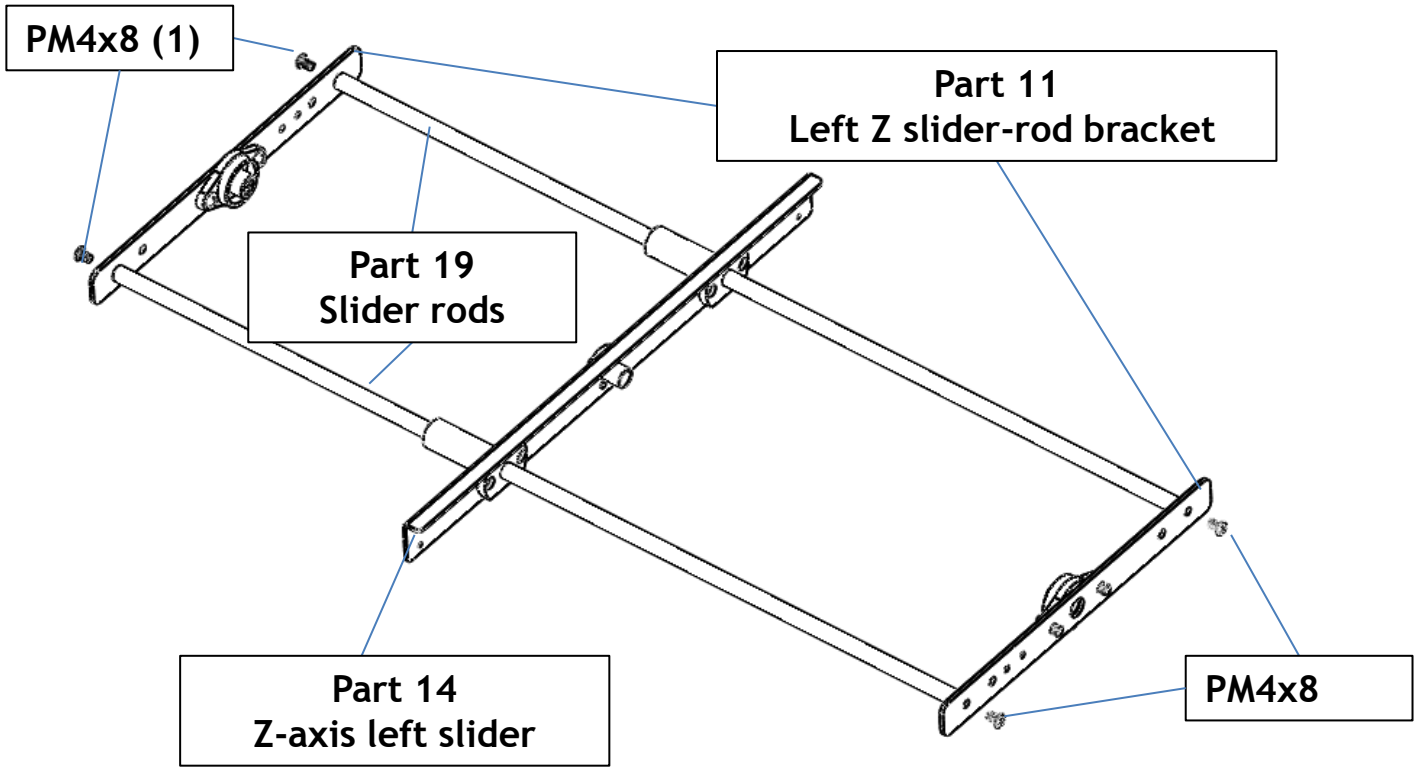
M3 spring shim *3

NOTE:

1. Timing pulley's inner diameter is 5mm.
2. The platform of the timing pulley is on the bottom.

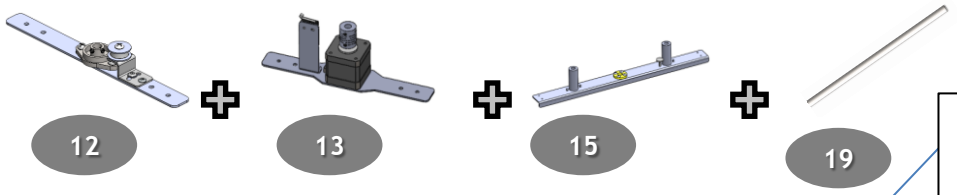
Assemble Z axis drive mechanism- left

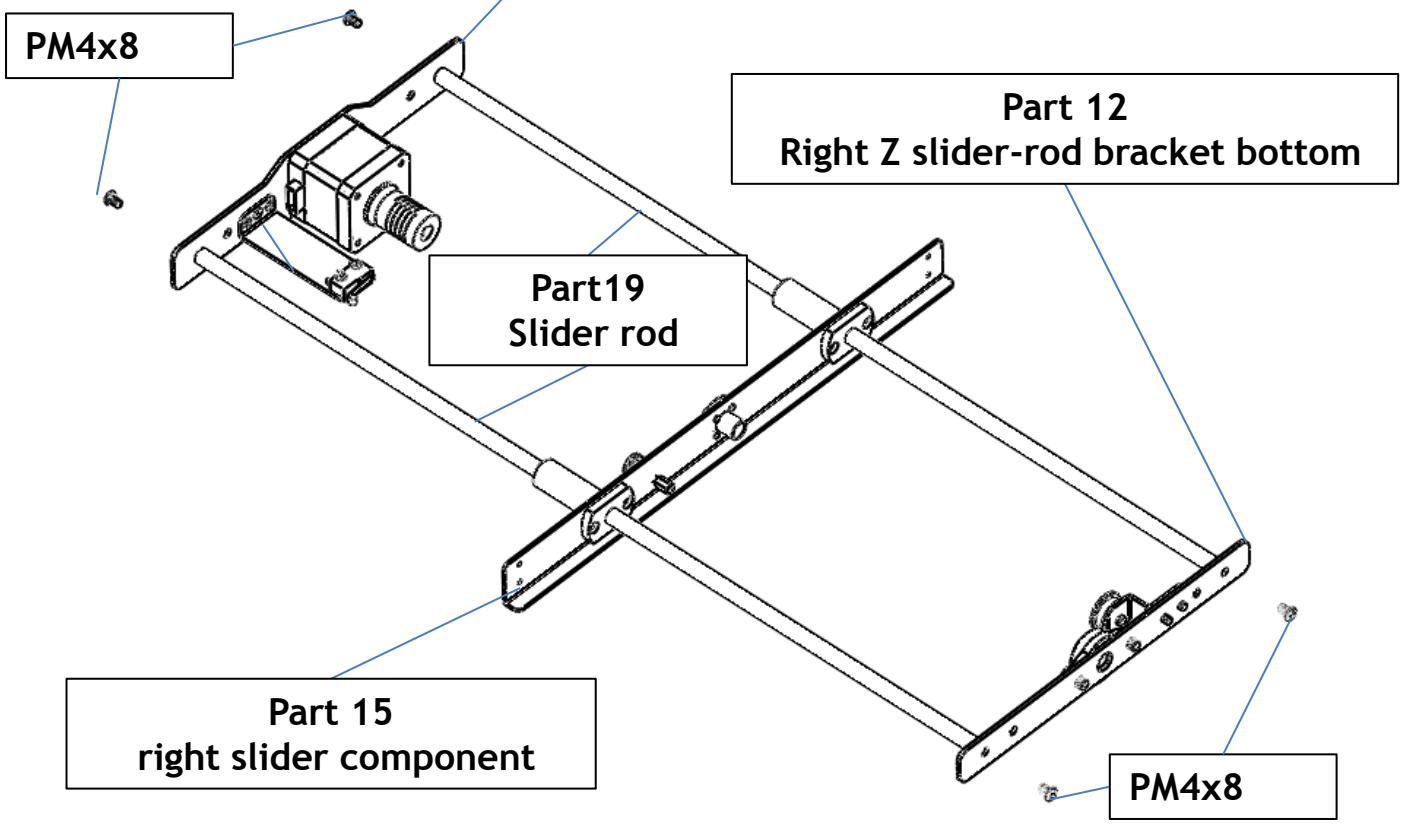




NOTE: Disassmbled the PM4x8 screws from end of the rods before installed it.

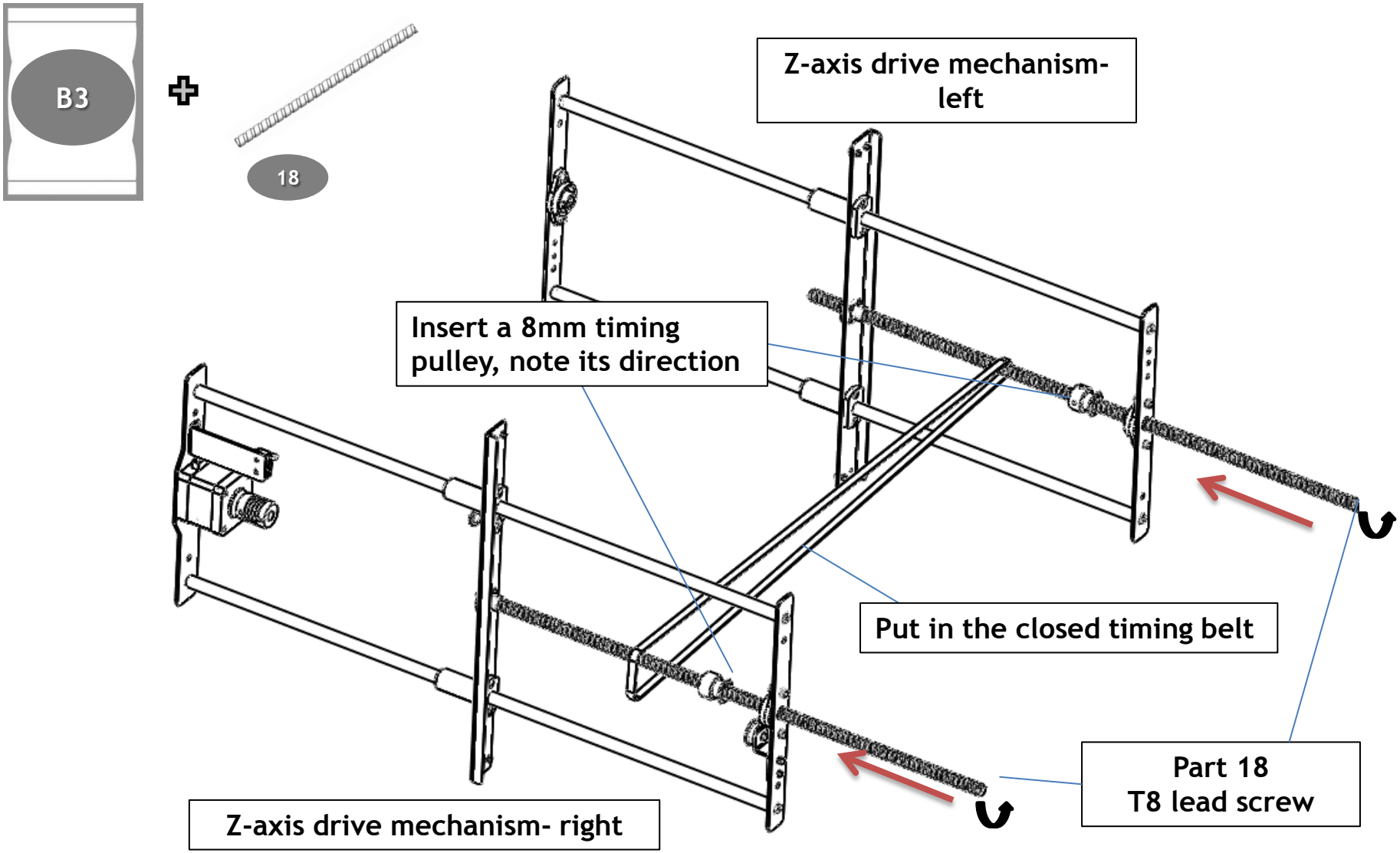
Assemble Z axis drive mechanism- right





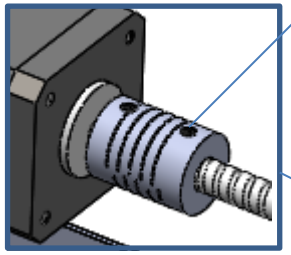
NOTE: Disassmbled the PM4x8 screws from end of the rod first before installed it.

Assemble Z axis drive mechanism



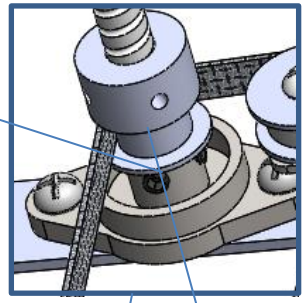
Assemble Z axis drive mechanism

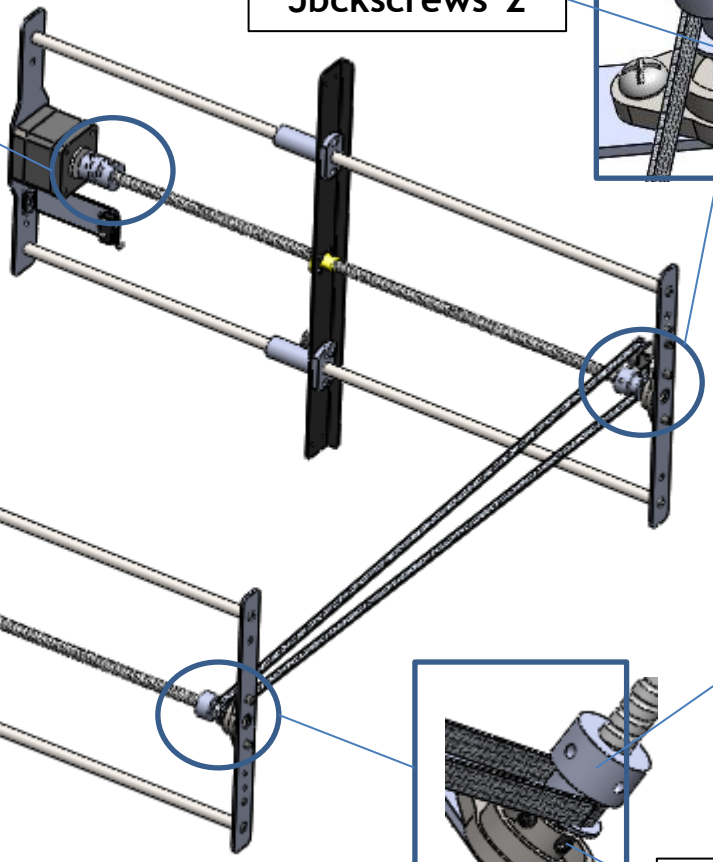
Jbckscrews*4



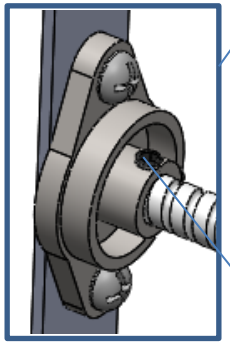
Spin in the lead screw and lock the jbckscrews

Jbckscrews*2





move the timing pulley to the bottom and lock the jbckscrews

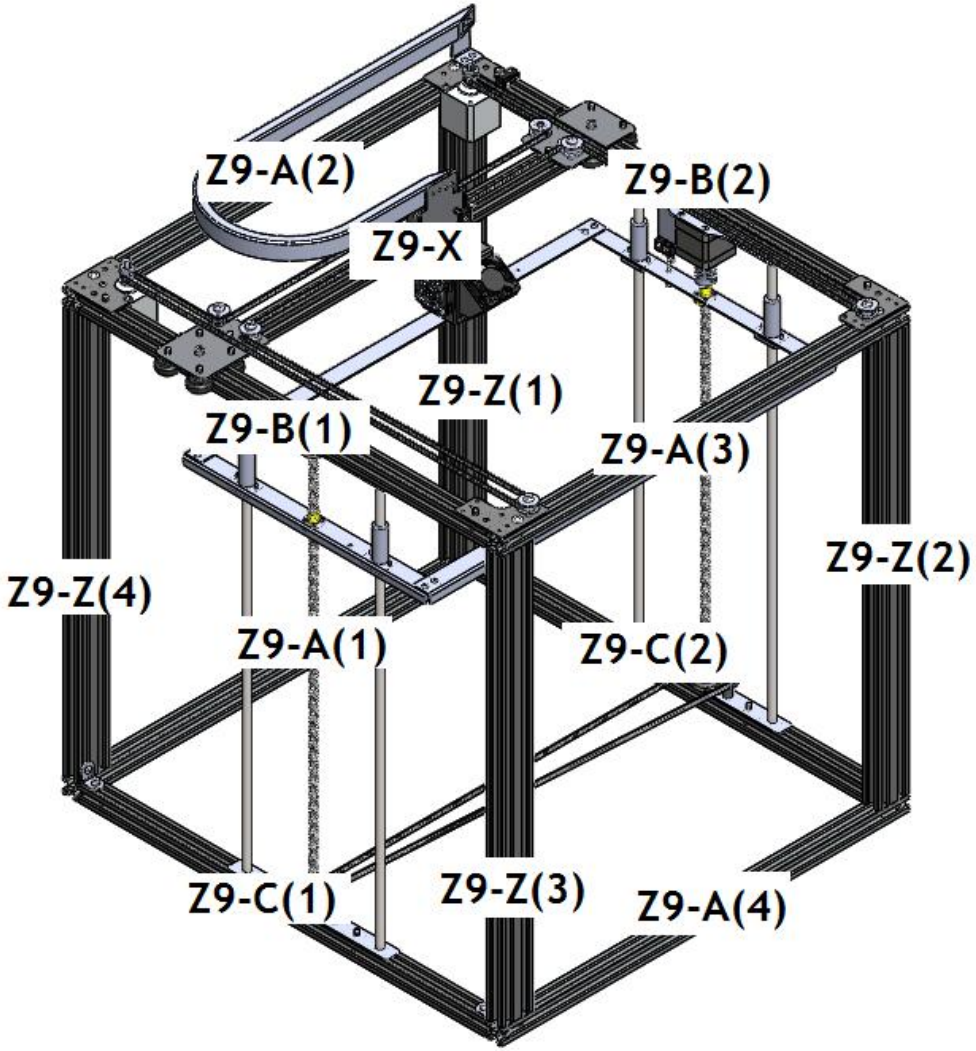


Tighten the jbckscrew to lock the lead screw

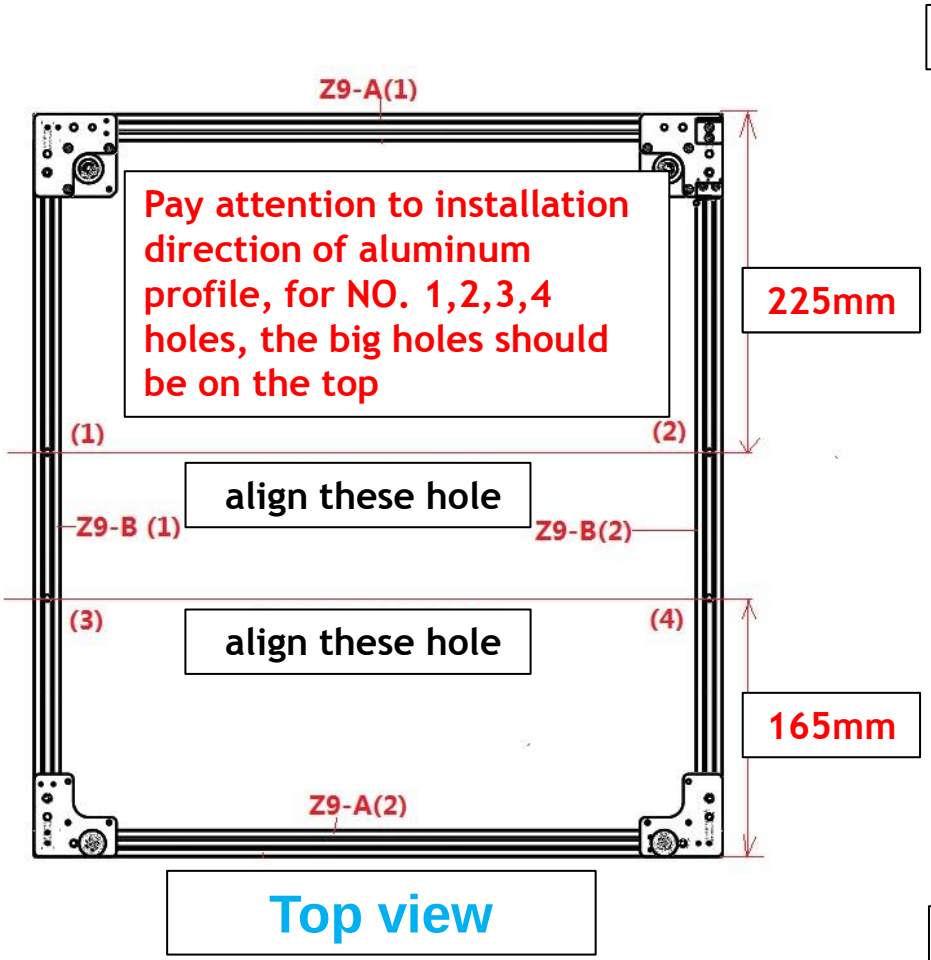
Jbckscrews*2

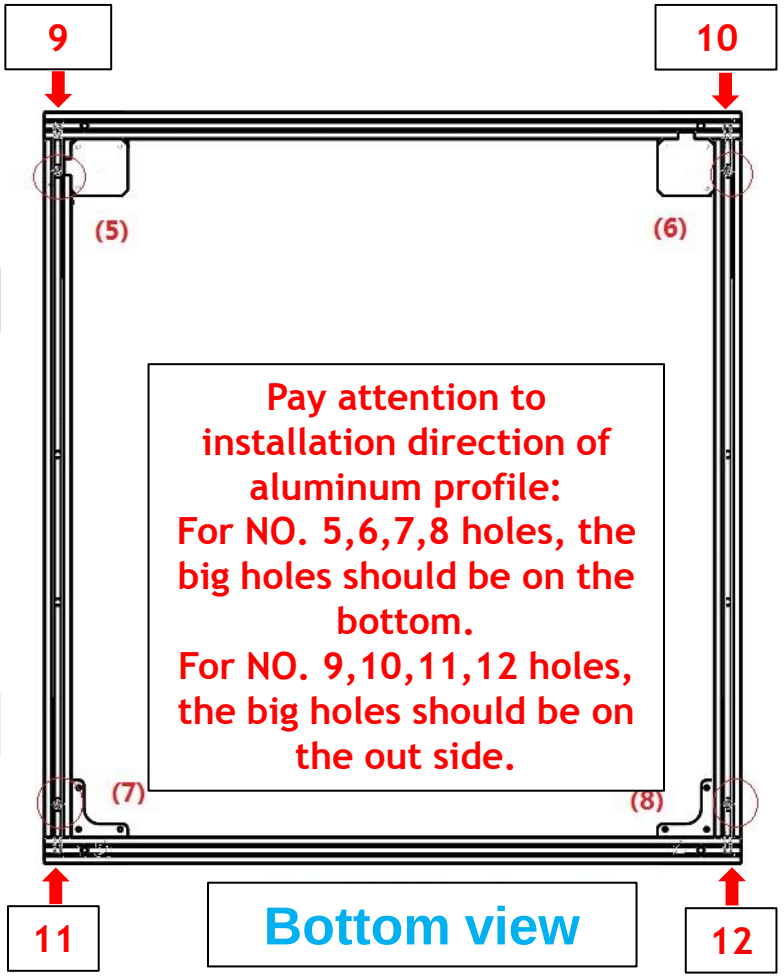
Aluminum profile preview

Now begin to install aluminum frame. Before installation, please follow the below picture to distinguish the specifications of the aluminum profiles.

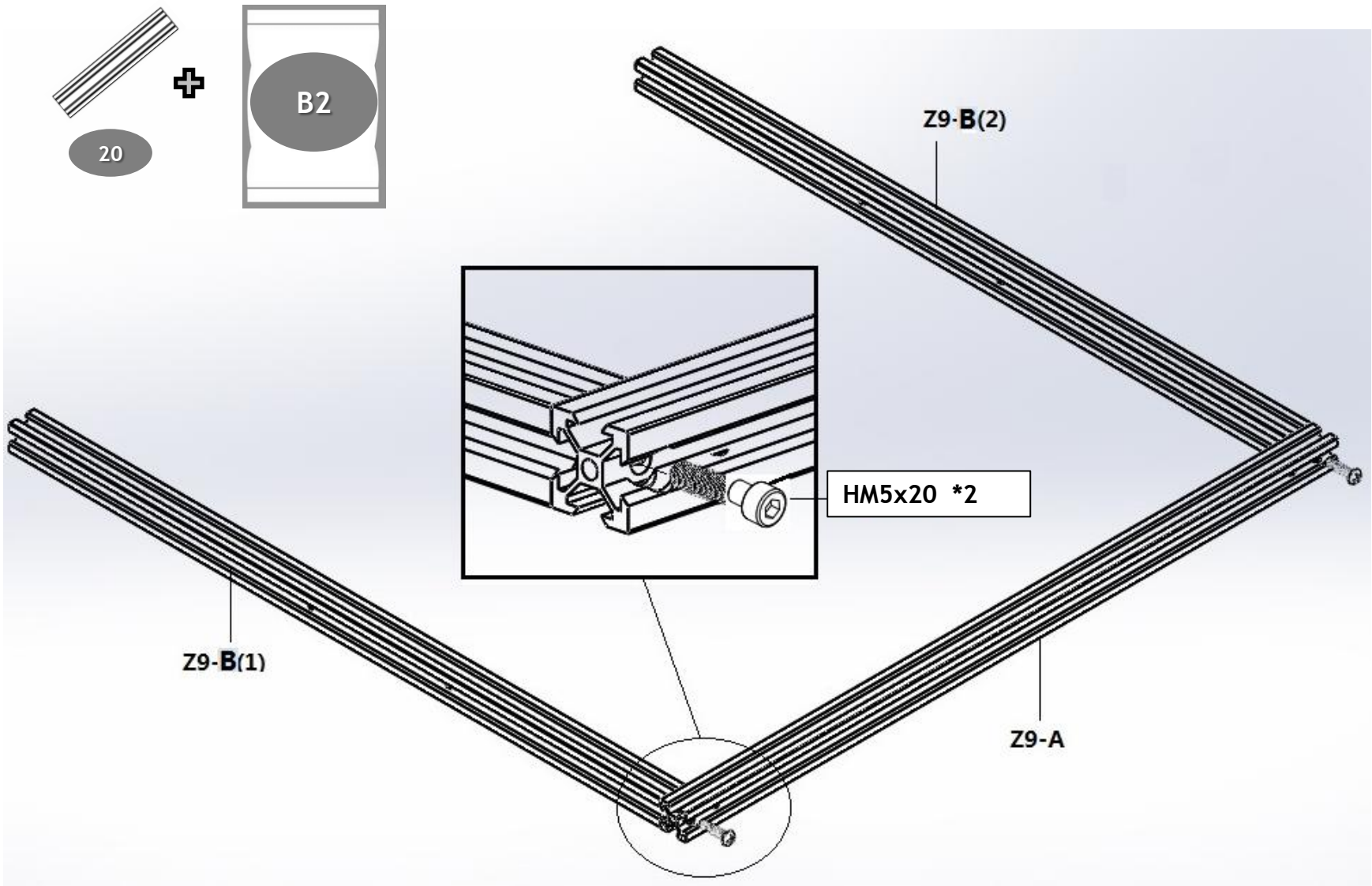


Top aluminum profiles preview

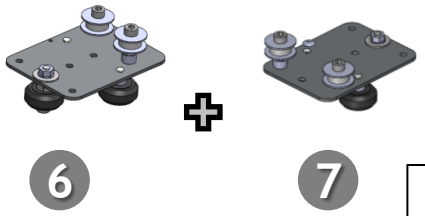




Top aluminum profiles frame assemble



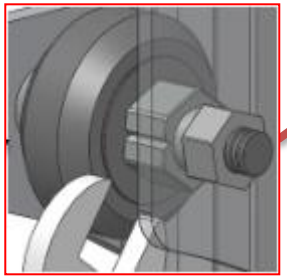
Install X Y carrier to top aluminum profile frame



For the RIGHT carrier There is a screw to touch the Y ENDSTOP

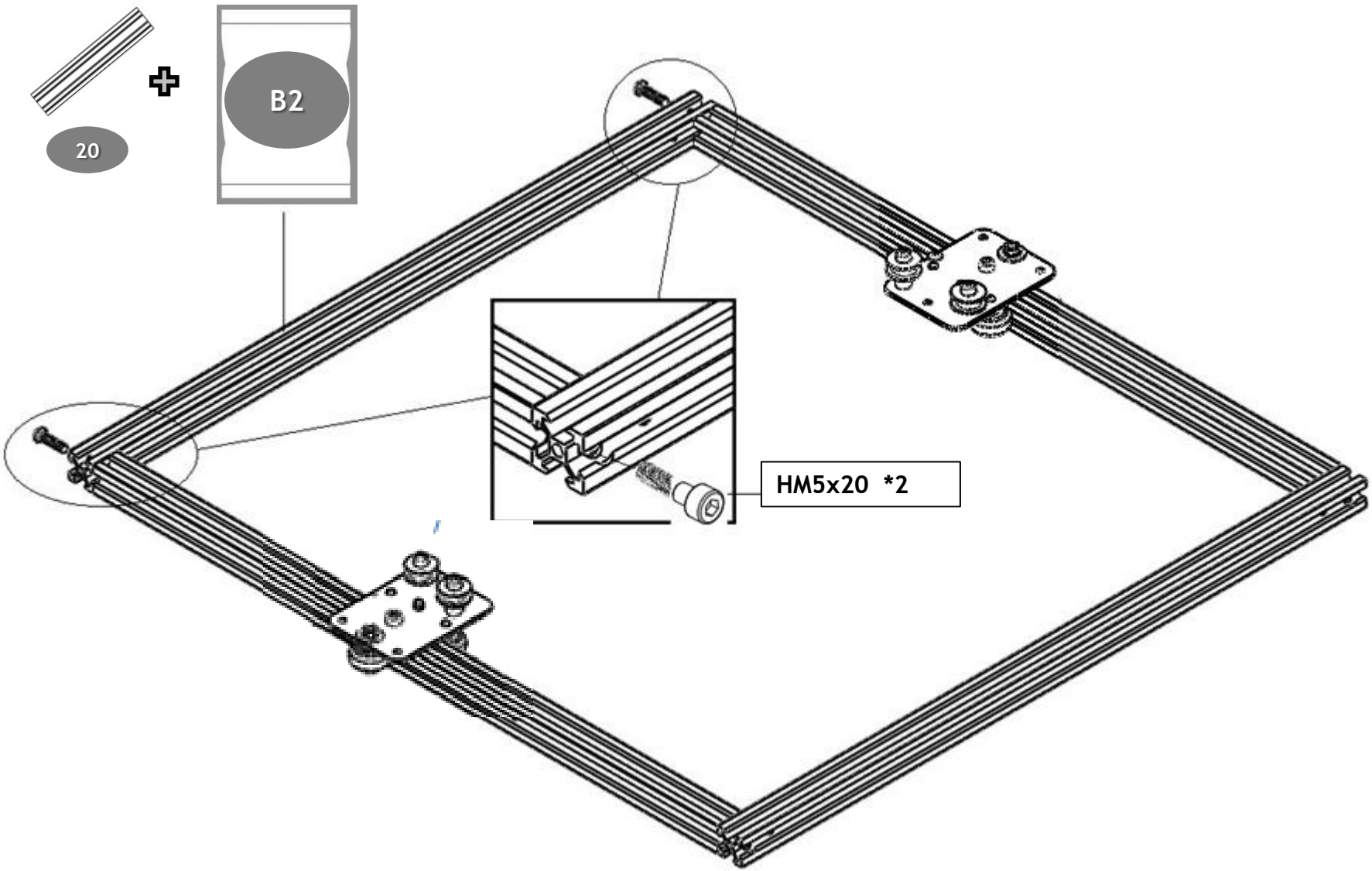
7. Y Carrier - **right**

6. Y Carrier - left

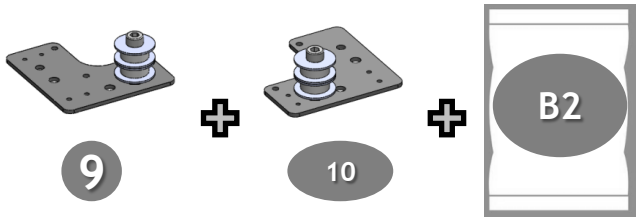


NOTE: If the carrier can't hold the rail well and move smoothly, adjust the eccentric column with a wrench.

Assemble top aluminum profiles frame



Install X Y bearing bracket



7. Y Carrier – right

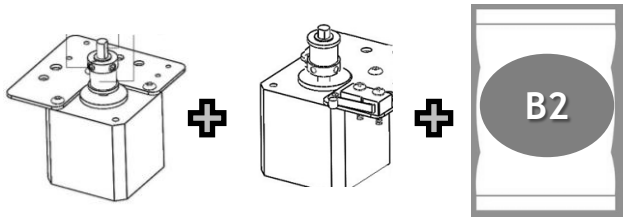
10.Y bearing bracket

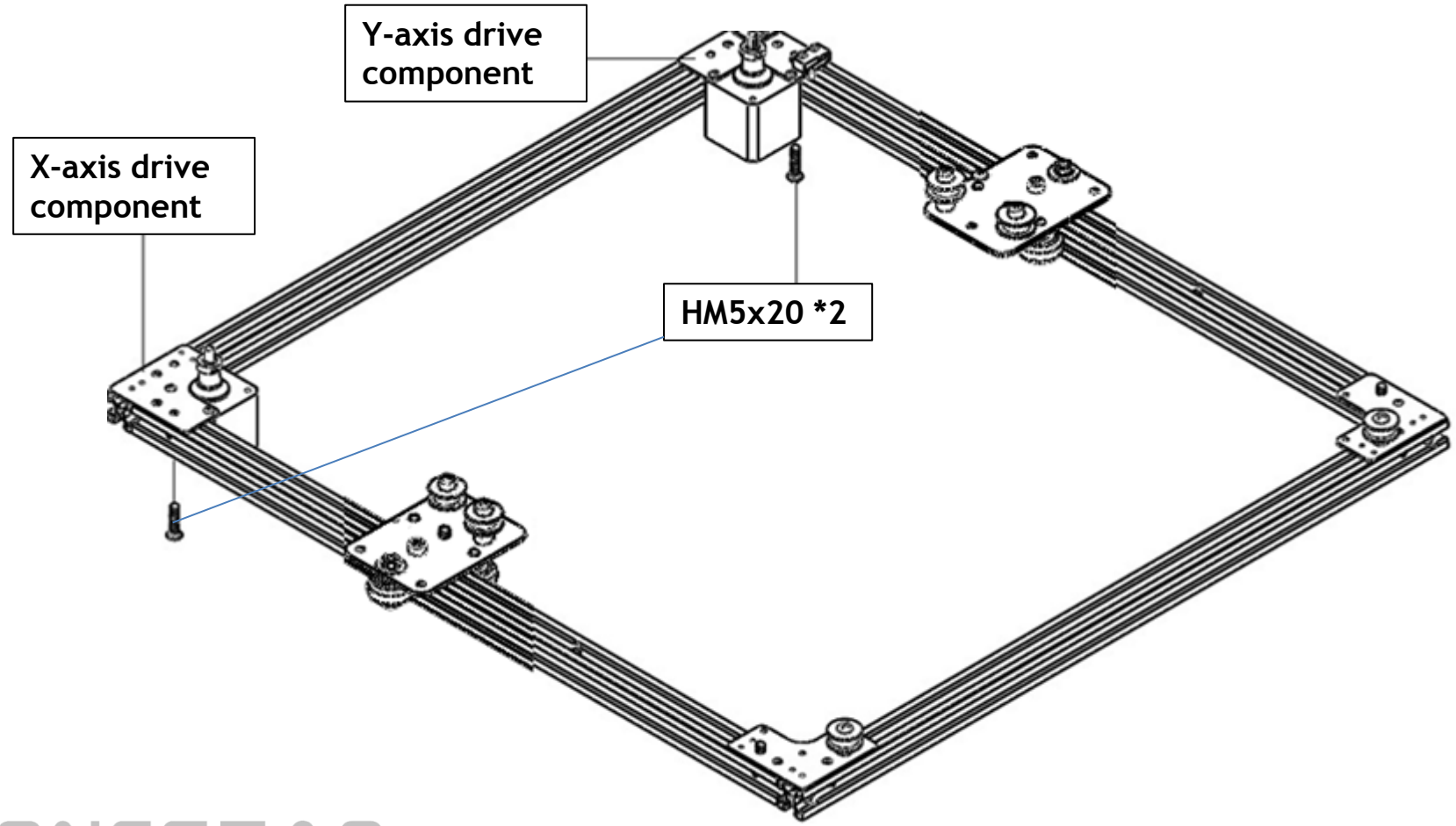
6. Y Carrier – left

9. X bearing bracket

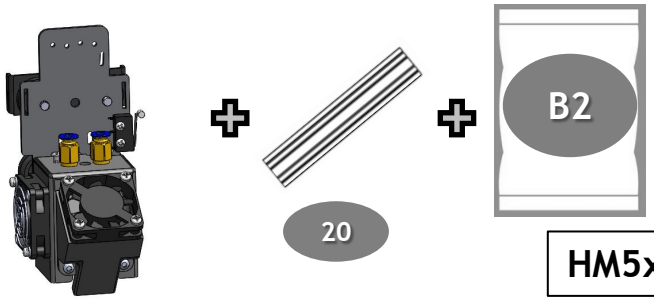
HM5x20 *2

Install X and Y drive components





Assemble X-axis mechanism



Bottom view

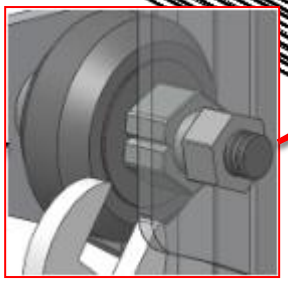
HM5x20

Insert the hotend first

PN: Z9-X

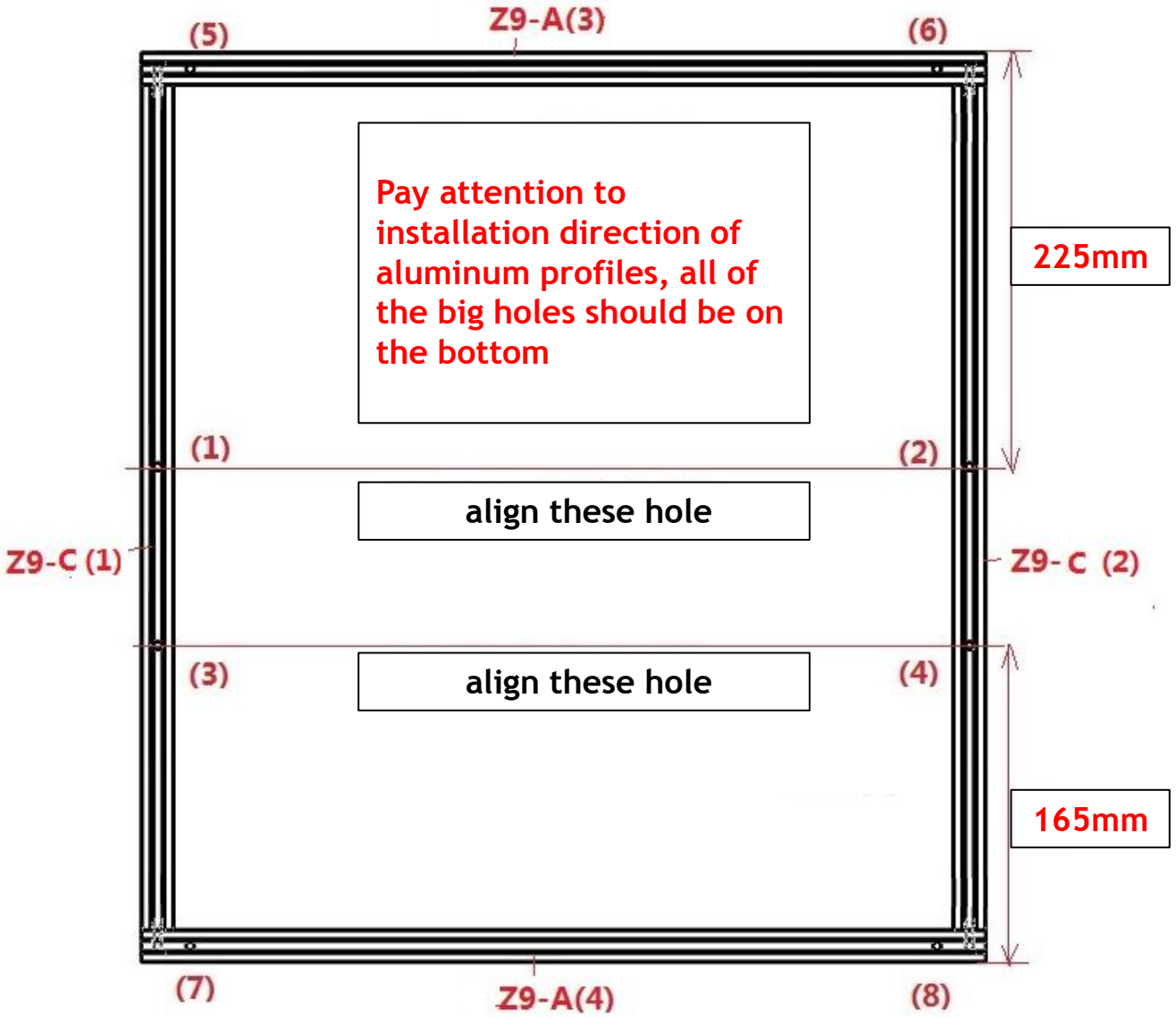
HM5x20

M5 spring shim



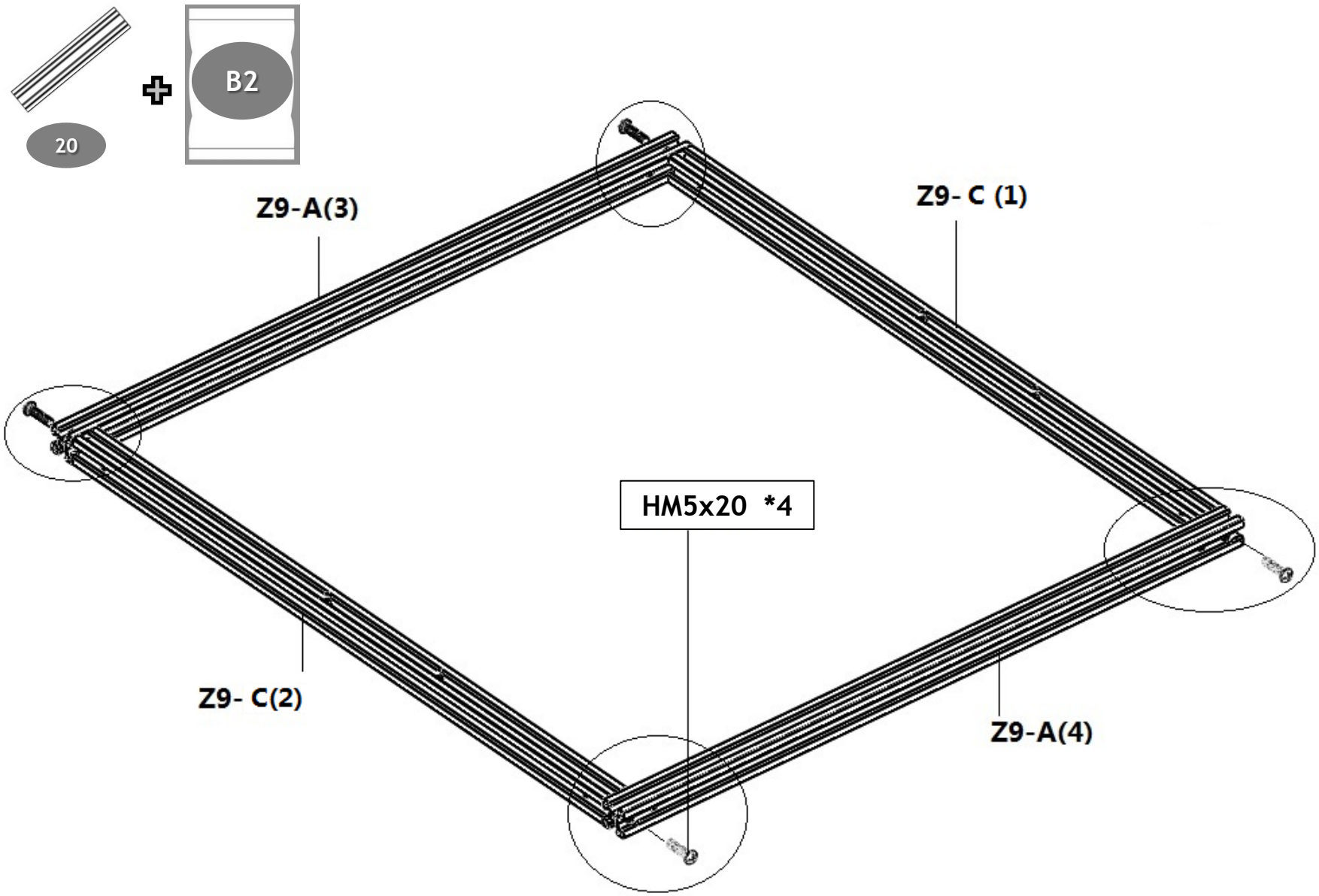
NOTE: If the printhead can't hold the rail well and move smoothly, adjust the eccentric column with a wrench.

Bottom aluminum profiles frame assemble

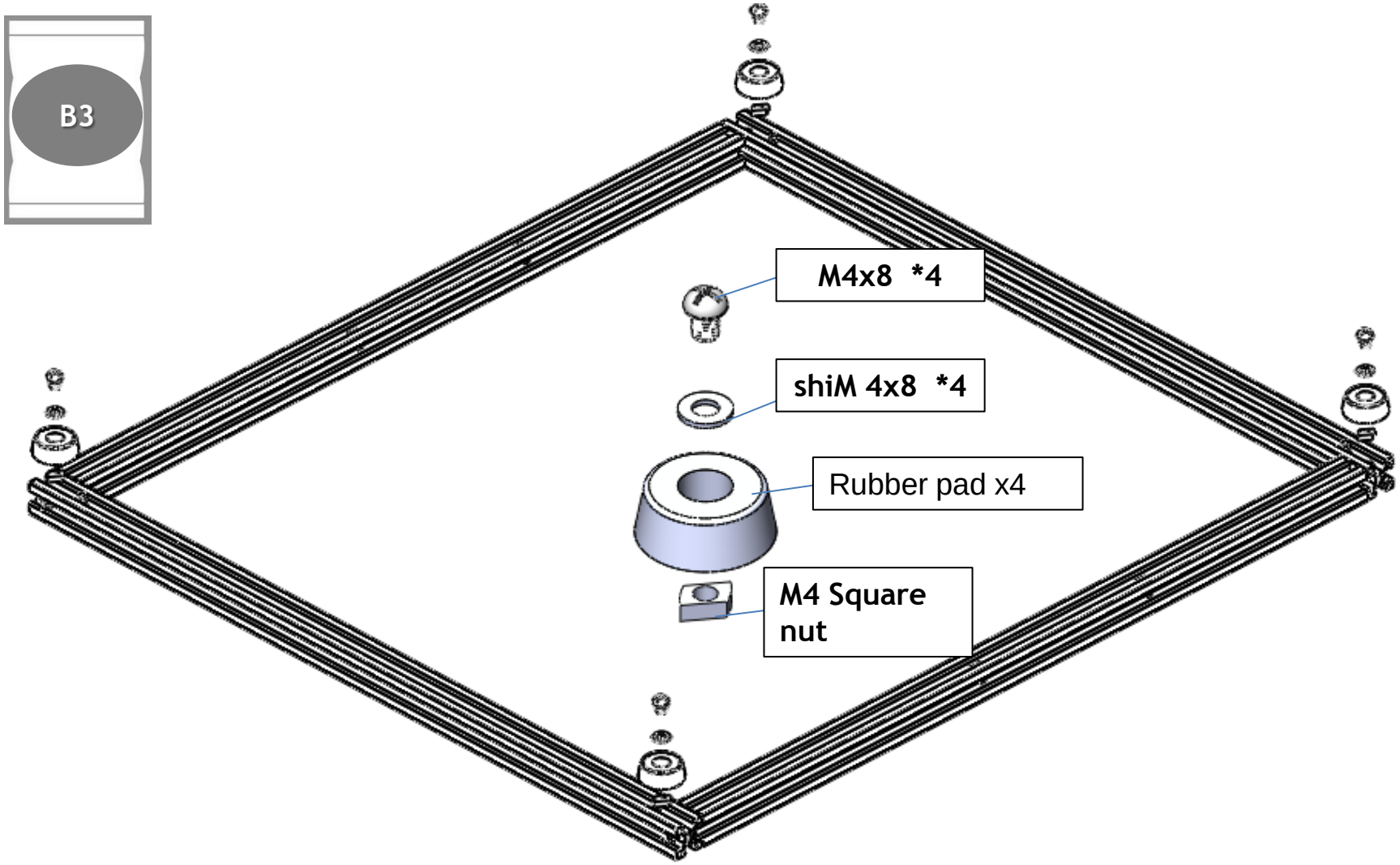


Top view

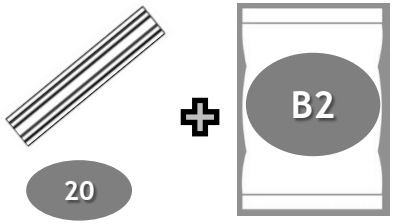
Bottom aluminum profiles frame assemble



Install Rubber pads

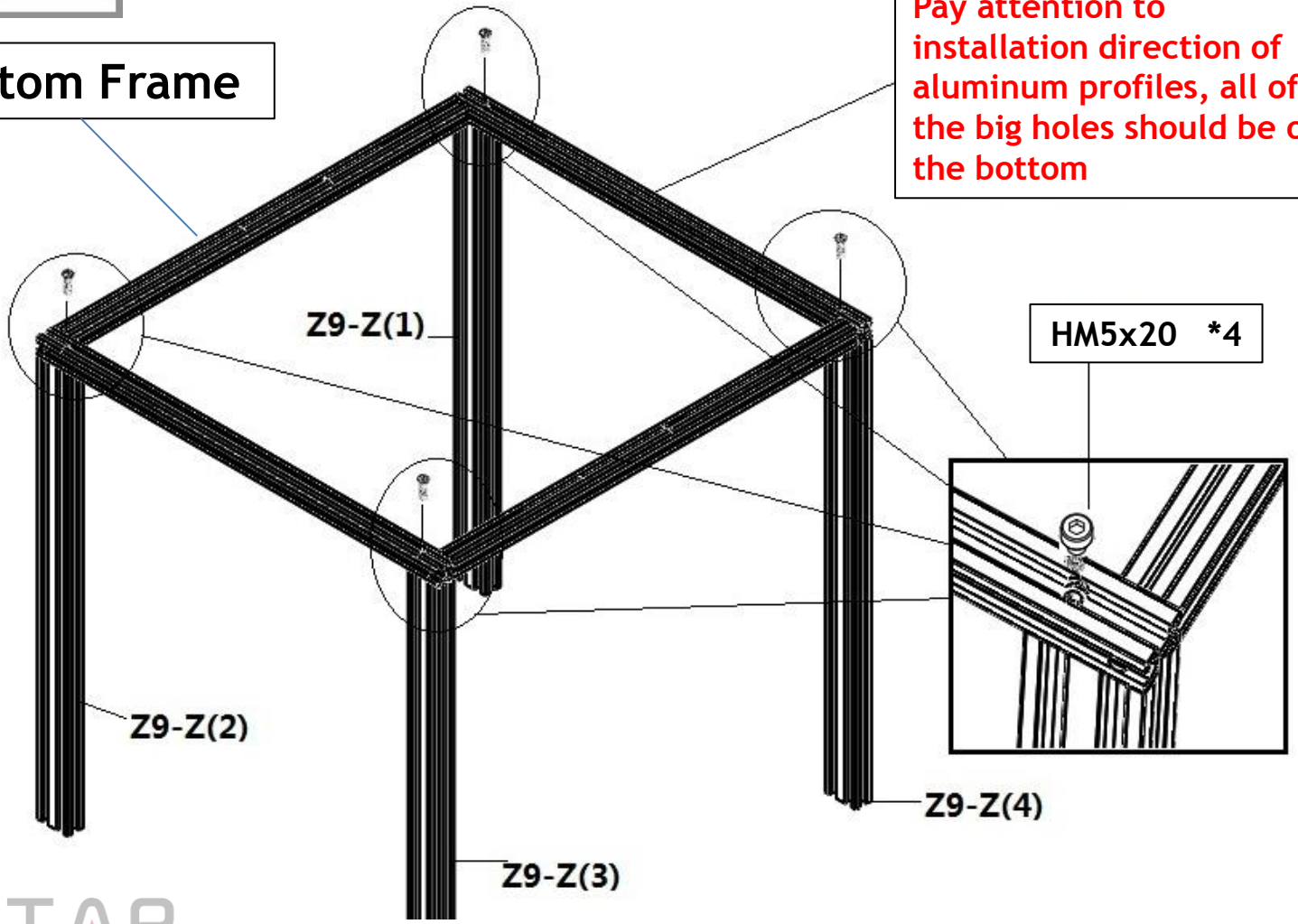


Assemble the side aluminum profiles frame



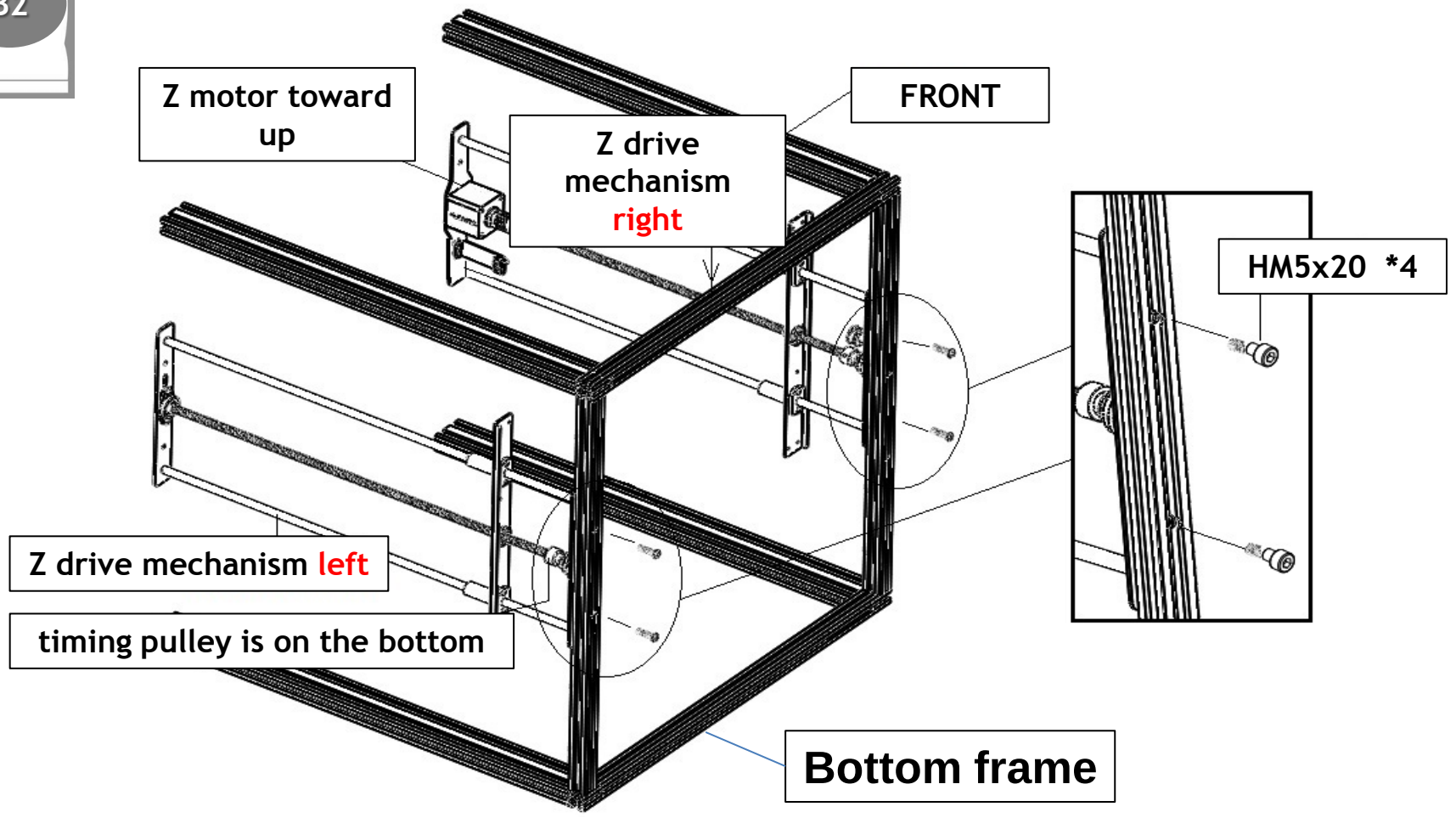
Bottom Frame

Pay attention to installation direction of aluminum profiles, all of the big holes should be on the bottom



Install Z drive mechanism to the frame

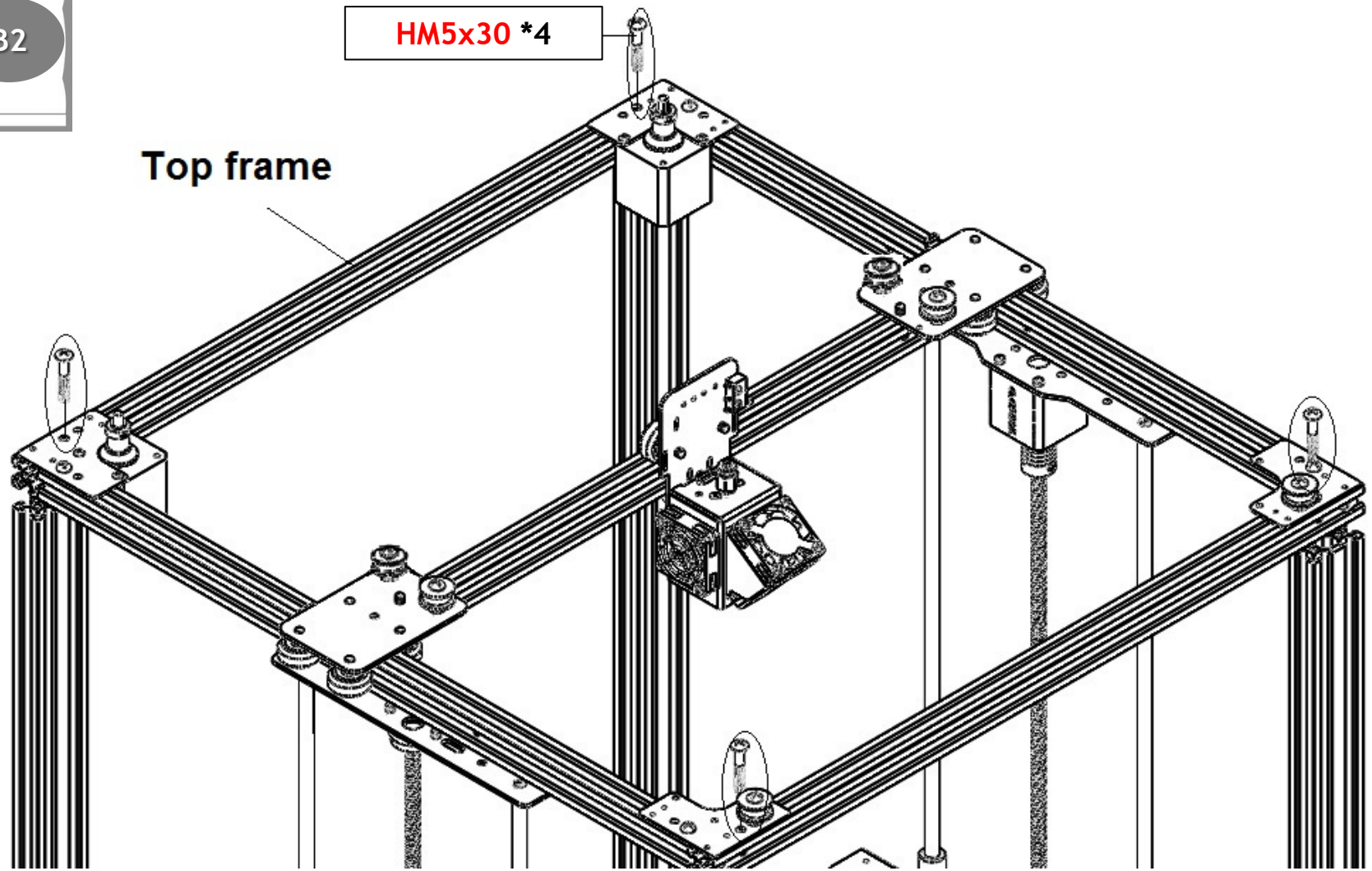
B2



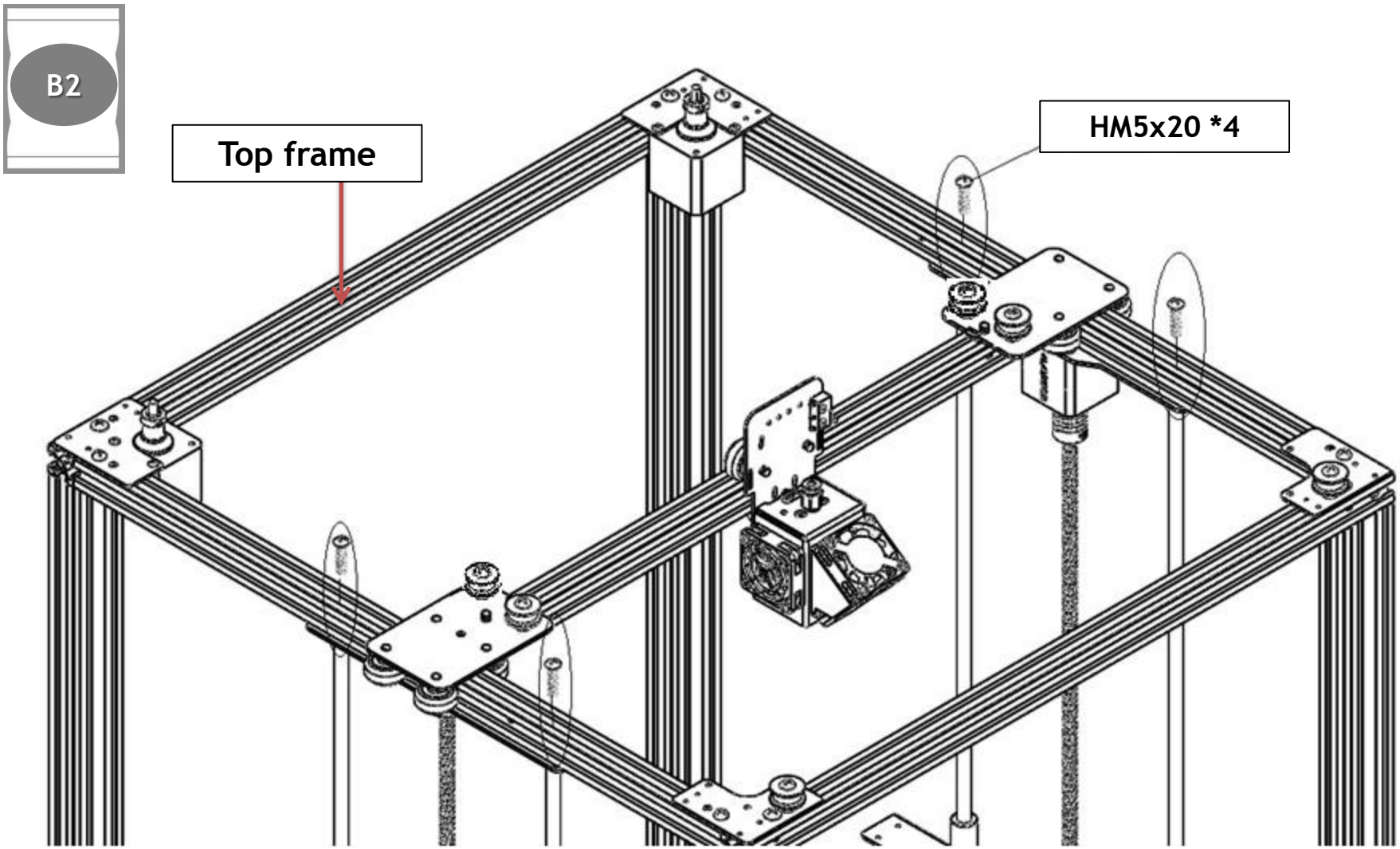
TIPS: There are closed timing belts between the left and right drive components, which are omitted in this picture for easy viewing.

Install top frame

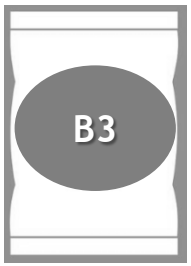
B2

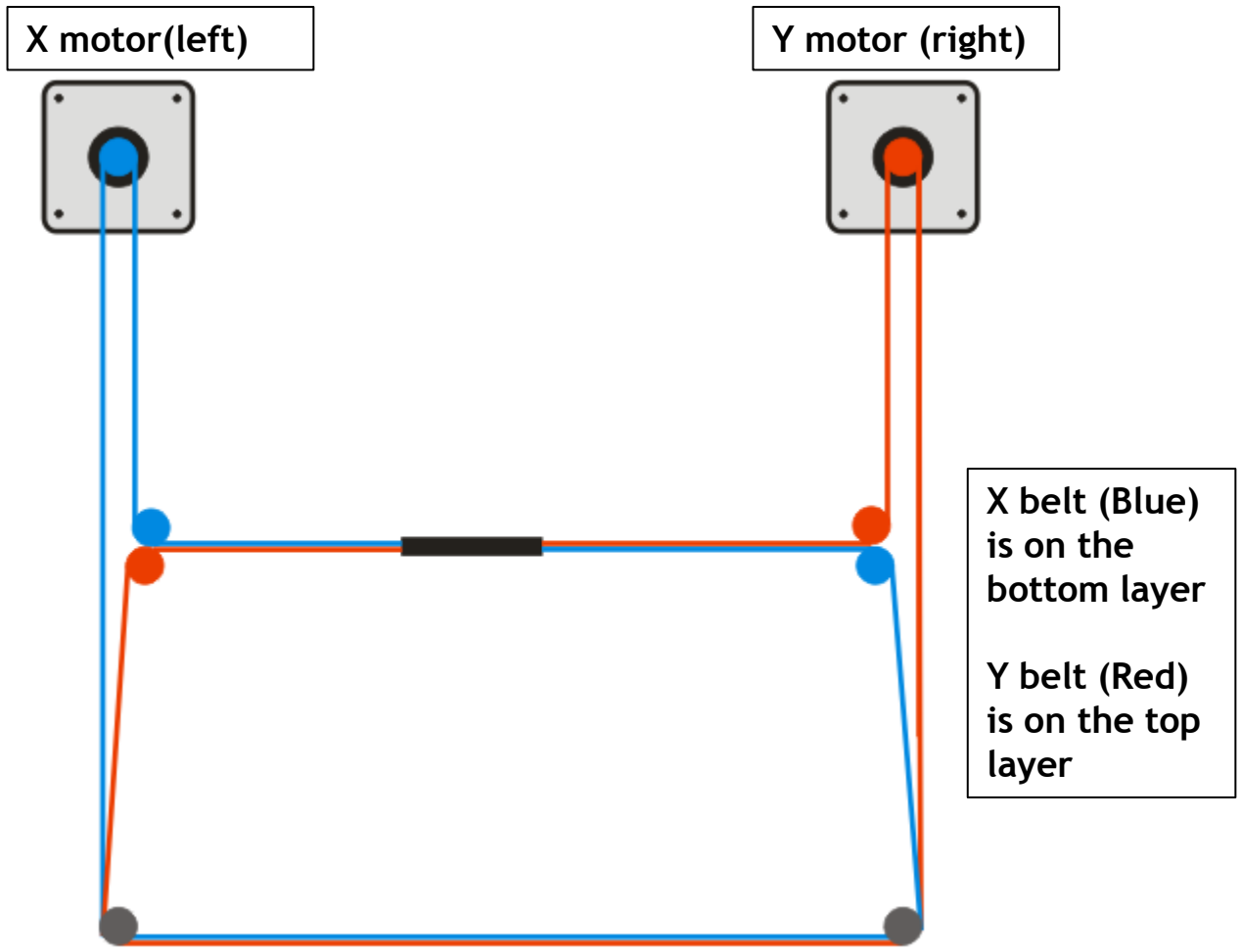


Install top frame

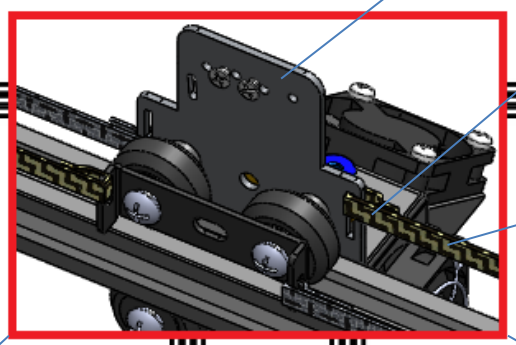


About the belts for X & Y



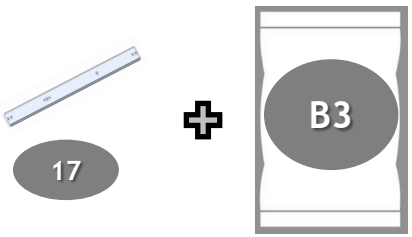


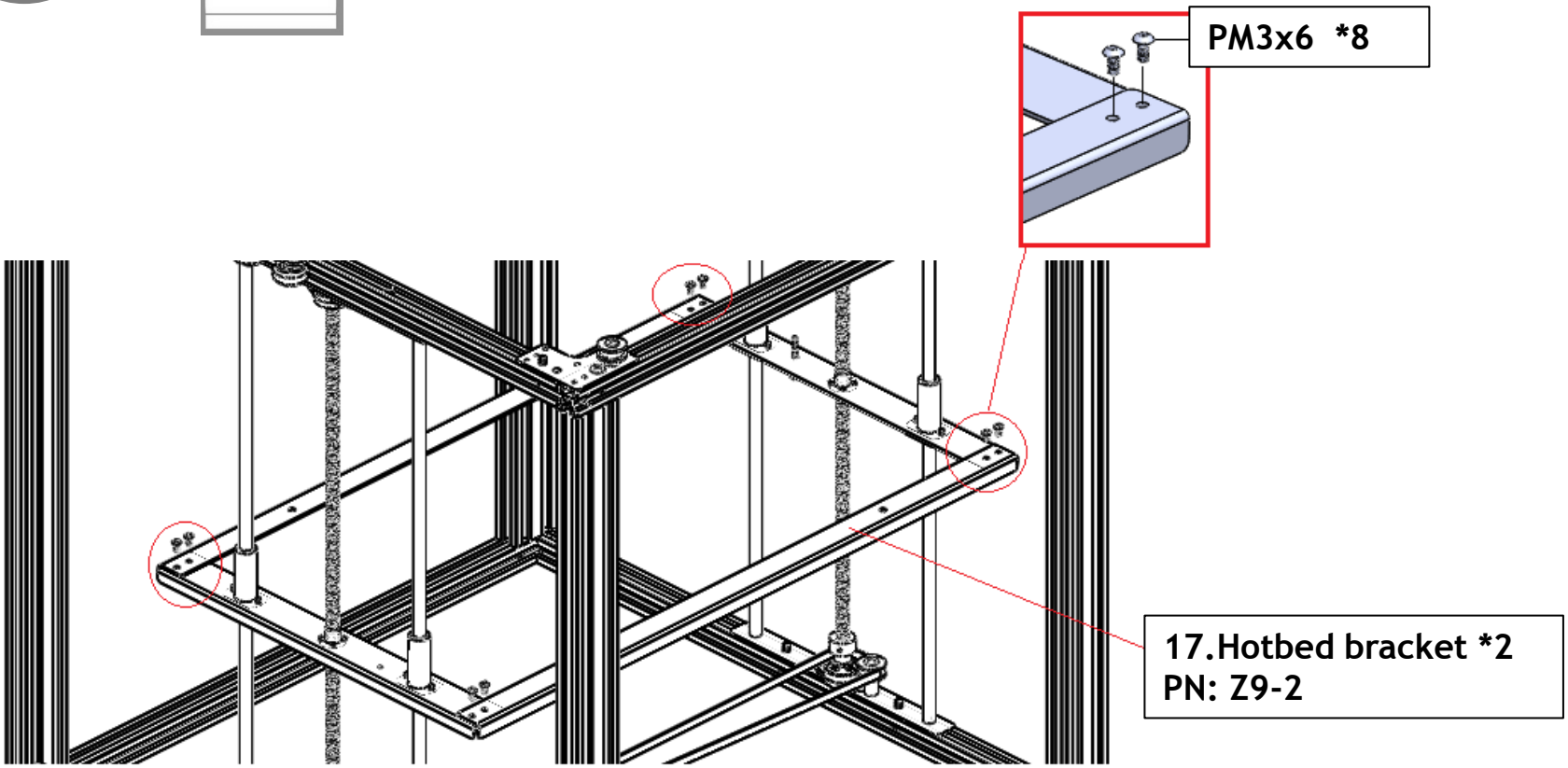
Install belts for X & Y



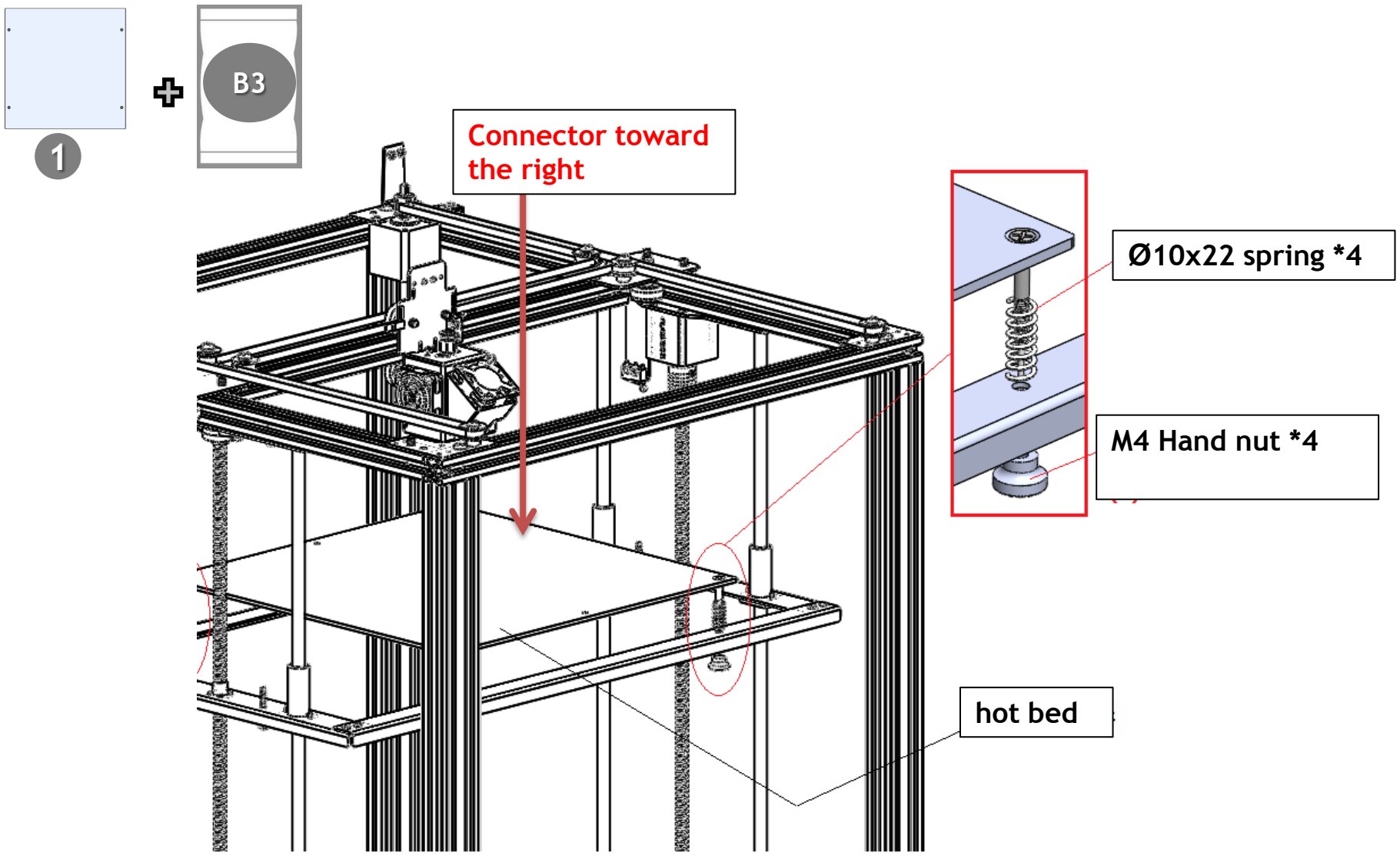
In order to keep the X and Y axes perpendicular, please follow below steps:
Step 1. fix the X and Y carrier on the top frame center by 2 pcs M5x20 screws.
Step 2. tigter the belt .
Step 3. Remove these two M5x20 screws.

Assemble hot bed Bracket



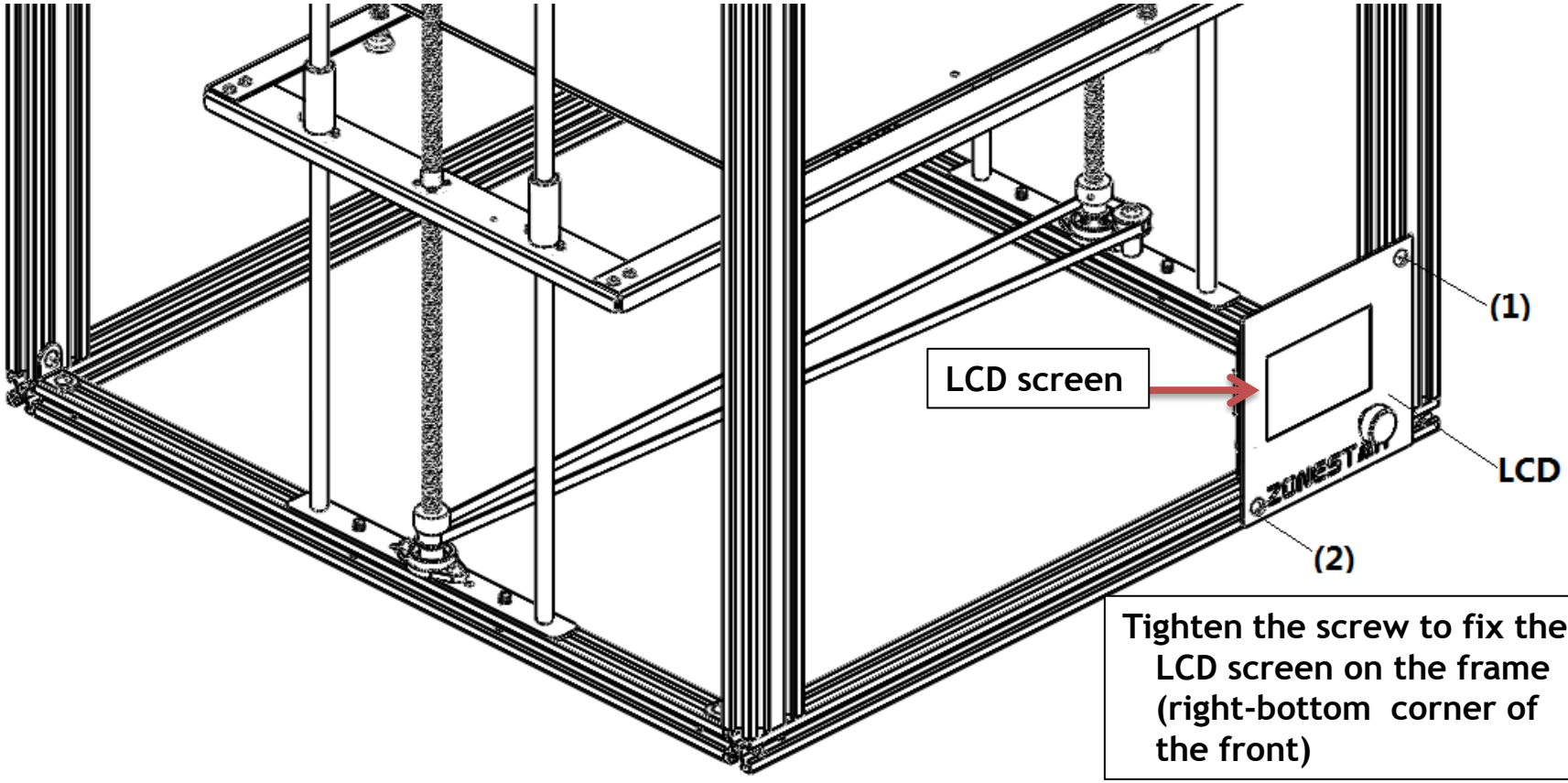


Install hot bed



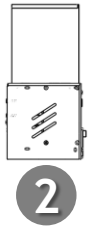
Install LCD screen

3



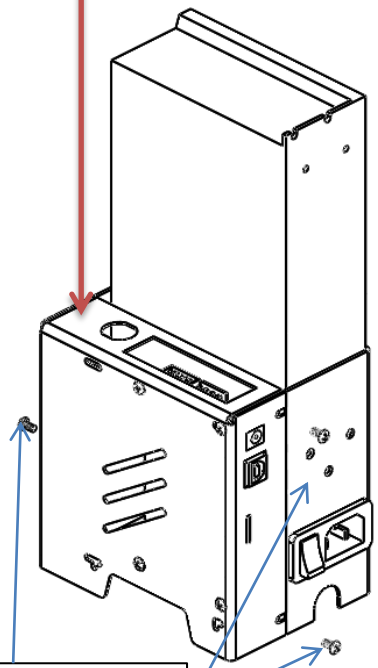
Tighten the screw to fix the LCD screen on the frame (right-bottom corner of the front)

Install control component

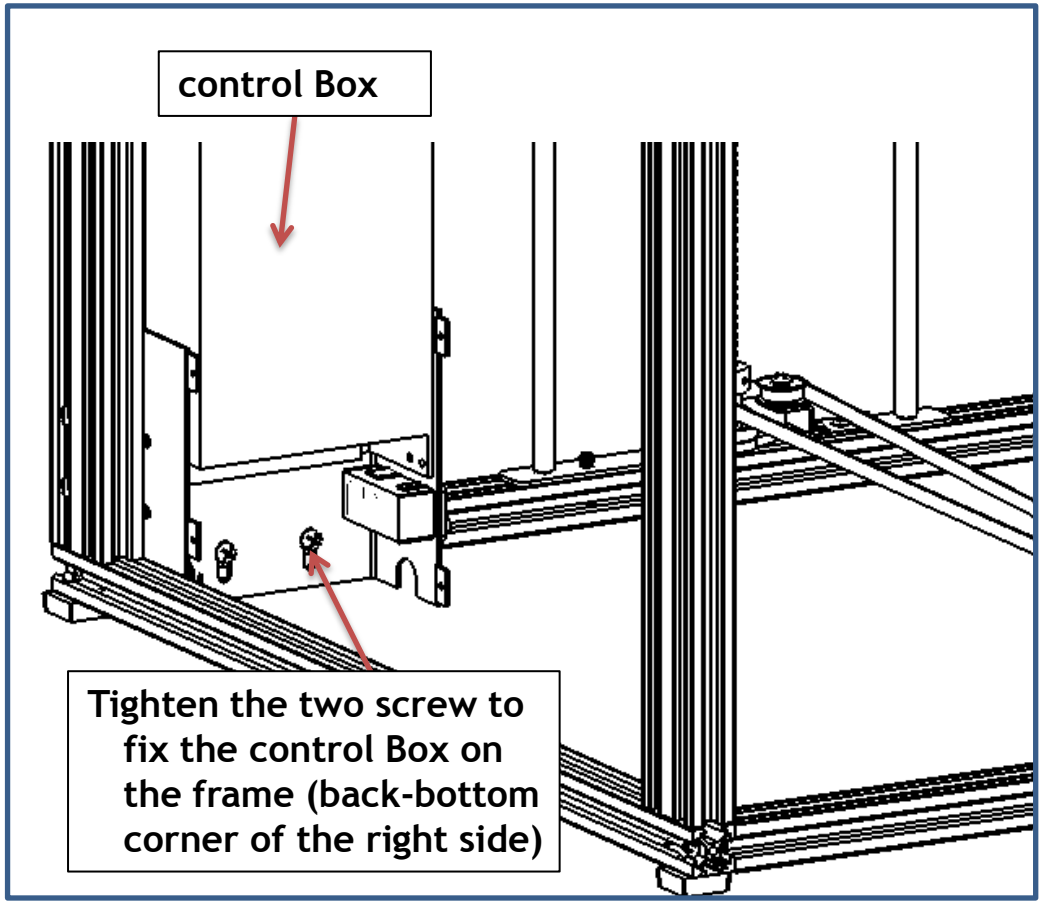


2

Open the control box first



Lossen these three screws

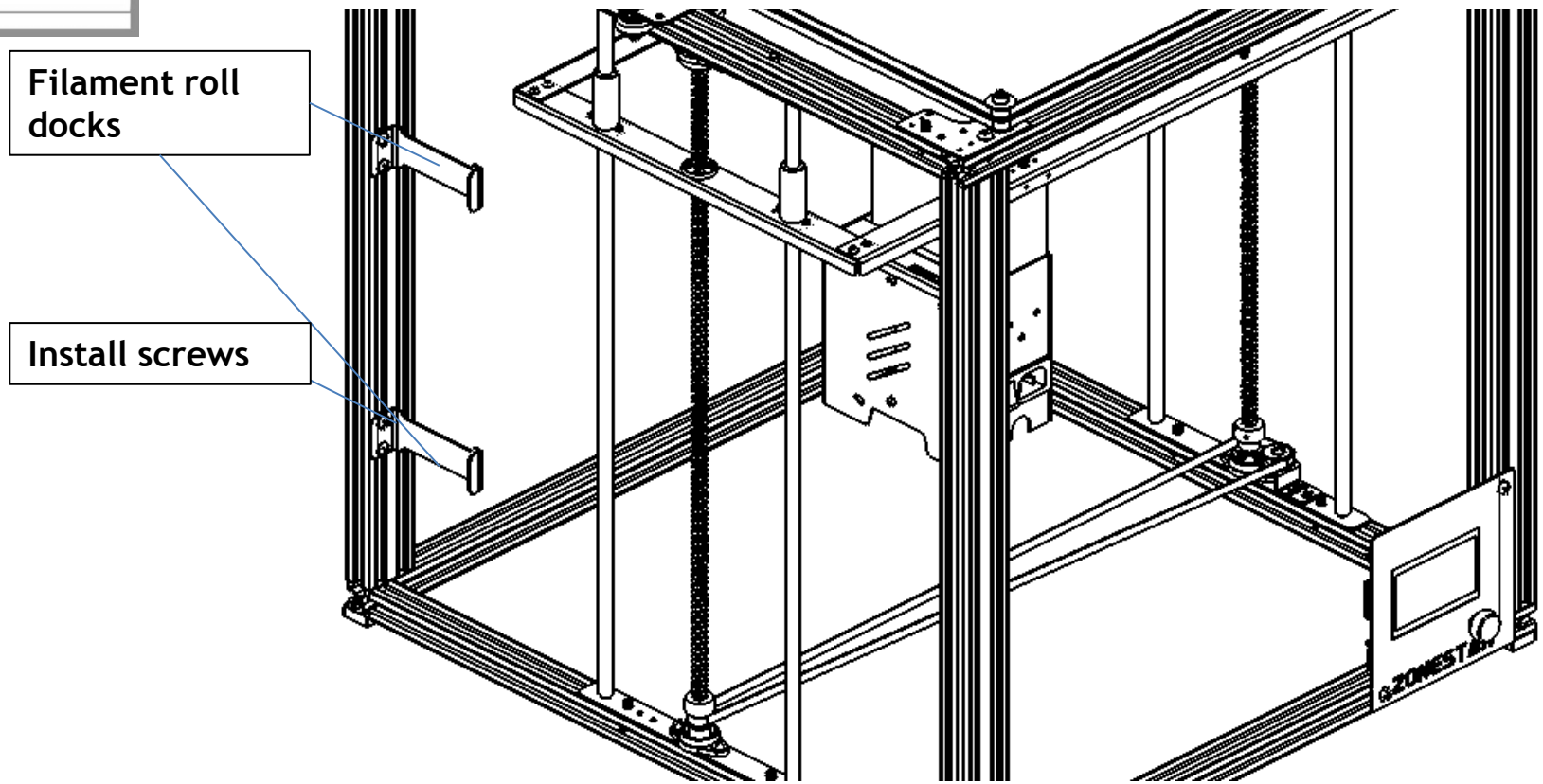


NOTE: Install the control box again after finished wiring.

ZONESTAR

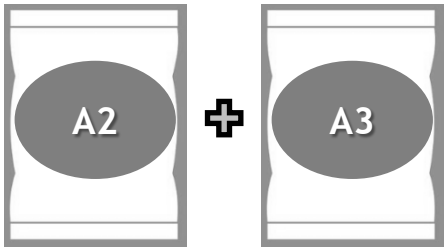
Install filament roll bracket

A3

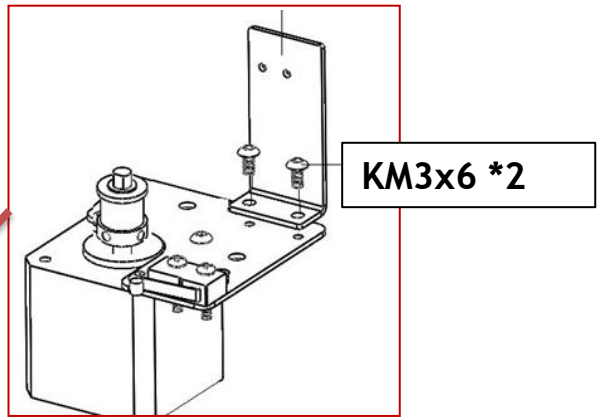


NOTE: Install 3 sets filament roll docks for Z9M3.

Assemble drag chain

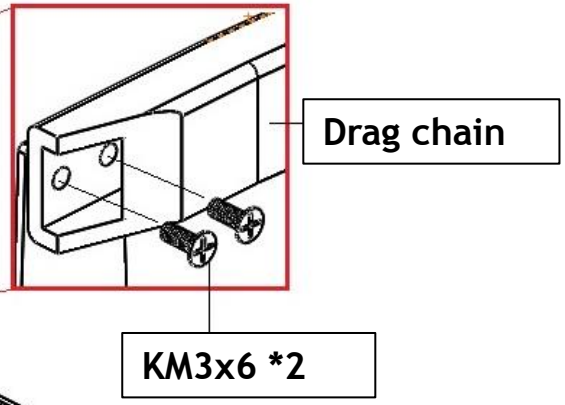


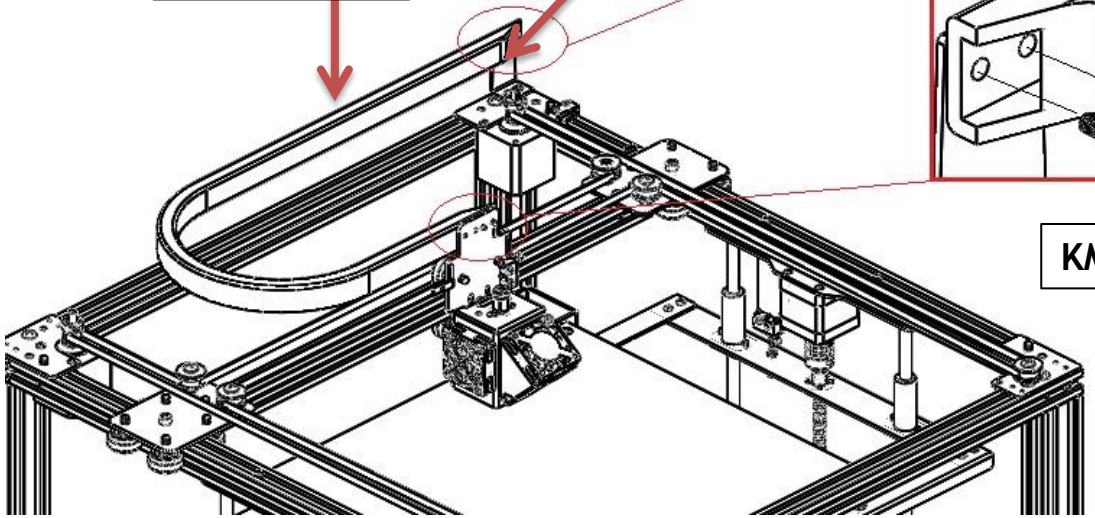
Install the Drag chain bracket to the Y motor bracket first



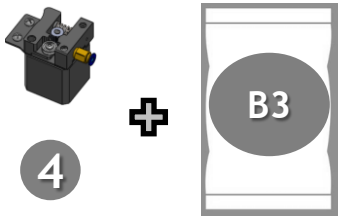
NOTE: The separate drag chain is for the convenience of placing the wiring. Please note that the hot end wiring should be passed through the drag chain in this step.

Drag chain





Install extrusion feeder and PTFE tube(Z9M2)



Step 3. Insert the PTFE tube (Filament guide)

Step 2. Install the fitting

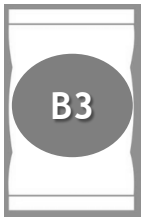
TIPS:
Presss the ring on the fitting and insert the PTFE tube.

Step 1. Lock the screw to install the extrusiong feeder on the frame, of the center

Install extrusion feeder and PTFE tube(Z9M3)

4

+



Step 3. Insert the PTFE tube (Filament guide)

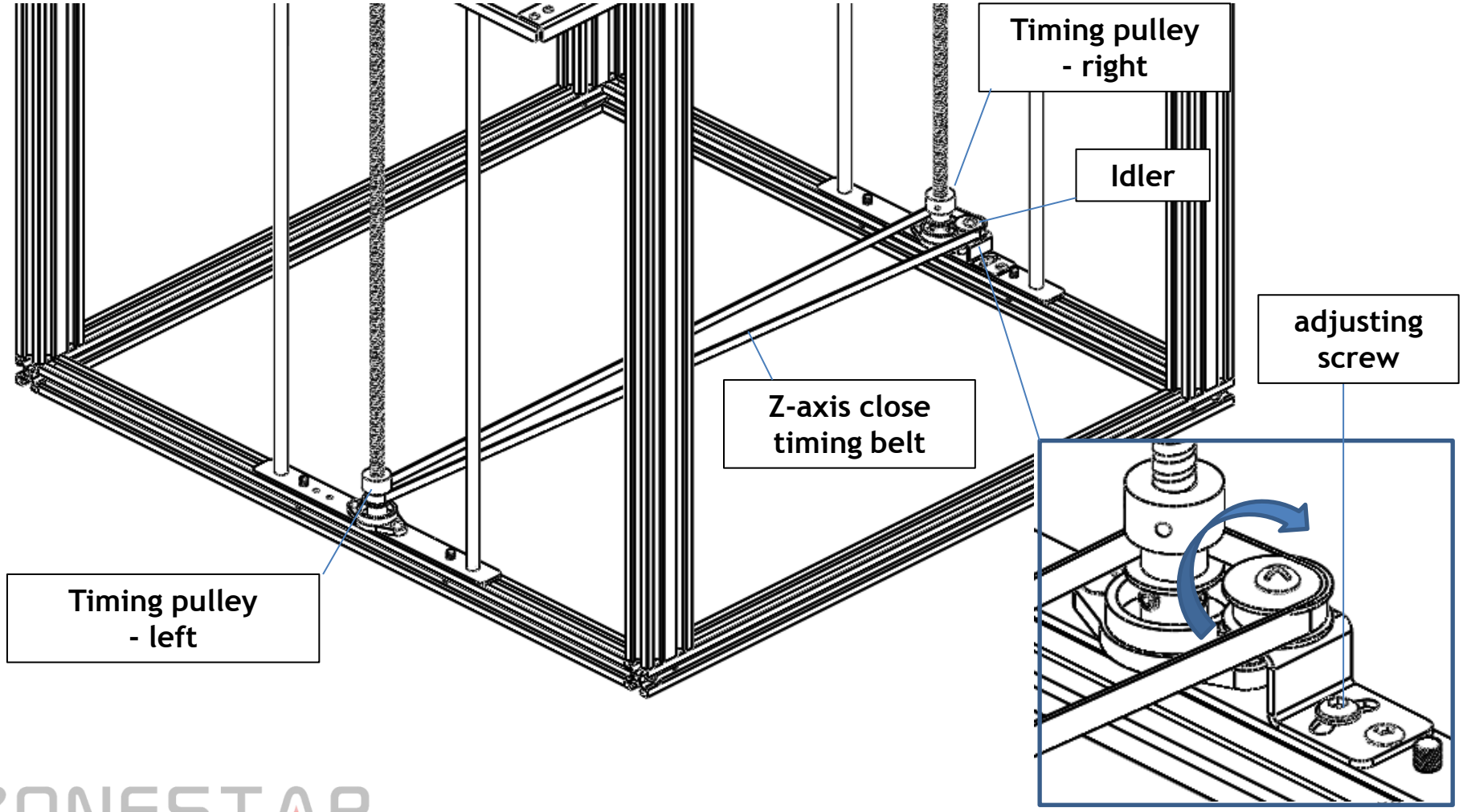
Step 2. Install the fitting

TIPS:
Presss the ring on the fitting and insert the PTFE tube.

Step 1. Lock the screw to install the extrusiong feeders on the frame, of the center

Auto the Z-axis synchronous drive system

For large-size 3D printers, since the printing platform is heavy, if the left and right sides are separated, there will be a problem of height inconsistency.
Z9 solves this problem by using synchronization belt to force synchronization of the left and right Z axes.
After the installation is complete, the Z-axis timing belt should be tightened by rotating the idler.

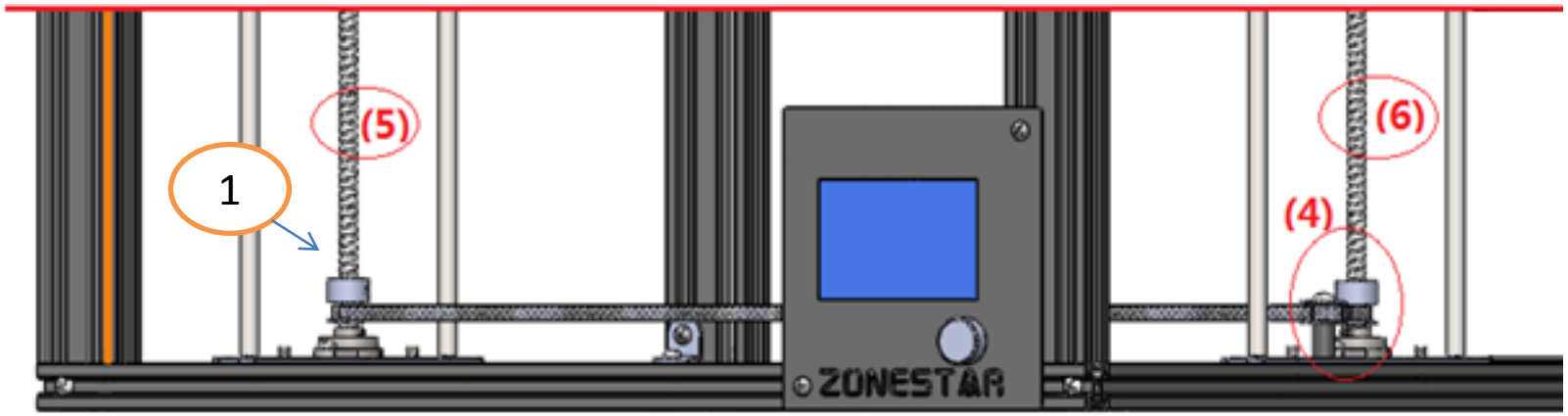


ZONESTAR

Level the Z aixs - step 1

First step, adjust the Z axis left and right slider components to the same height, steps as following:

1. loosen the set screws of the Z-axis timing pulley(fig 1).
2. Manully Rotate the lead screws (fig 5 and 6) to move down the hotbed to the bottom, until both of the right and left copper nut touched the timing pulleys.
3. Tighten the set screws lock the timing pulleys to the lead screw again.



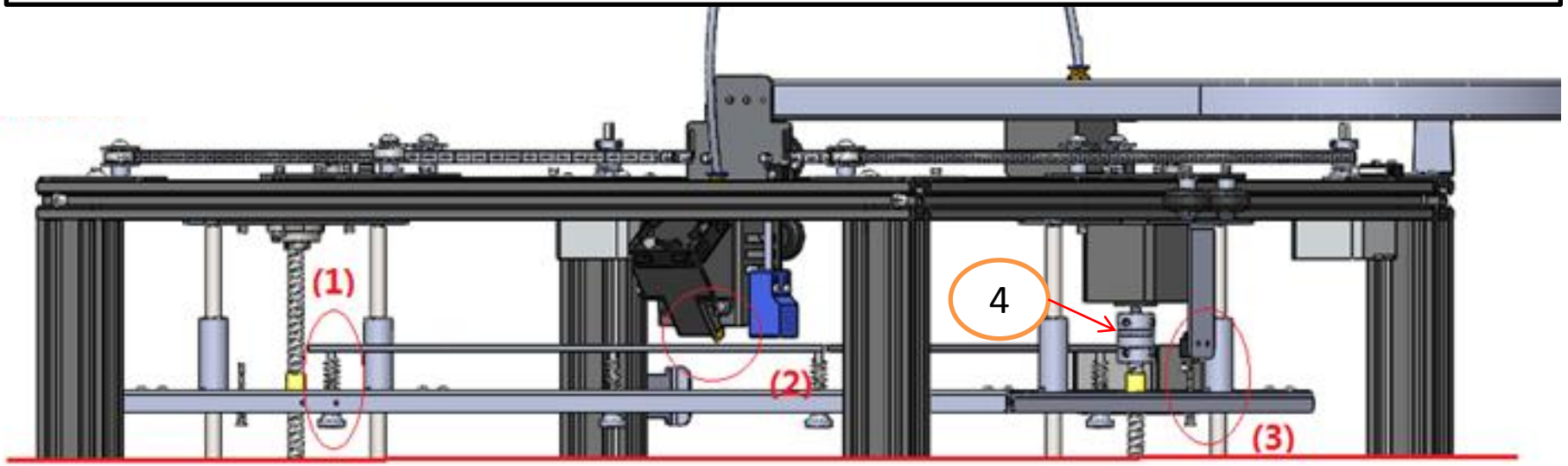
Level the Z aixs - step 2

Second step, adjust the position of Z limit switch, steps as following:

1. Adjust four hand nuts under the hot bed (fig 1), so that the distance is almost the same between the hot bed and the hot bed bracket (The end of the screws are flush with the hand nuts).

2. Rotate the coupling (fig 4) to move up the hot bed and stops when the nozzle (fig 2) is almost touched the hot bed.

3. Adjust the height of ***Z offset adjusting screw*** (fig 4) and stops when the Z- ENDSTOP has just been triggered. lock the screw by nylon pole after finish.



Wiring Guide

- Attention.
- Wires layout
- Pin out of ZRIB V6
- Wiring diagram
- Power supply wiring
- How to change the direction of stepper motor
- How to adjust the current of motor

!Attention!

Take care when installation, to avoid electrical shock hazards!

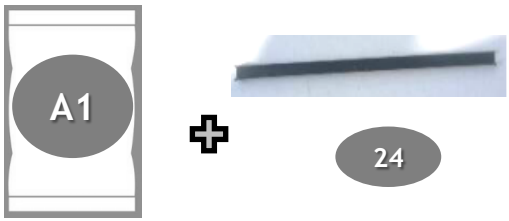
Once the connection is completed, please confirm again.
WRONG WIRING MAY DAMAGED THE ELECTRONIC DEVICE!

Some parts has lager operating current, please make sure the the wire and the terminal contact well.

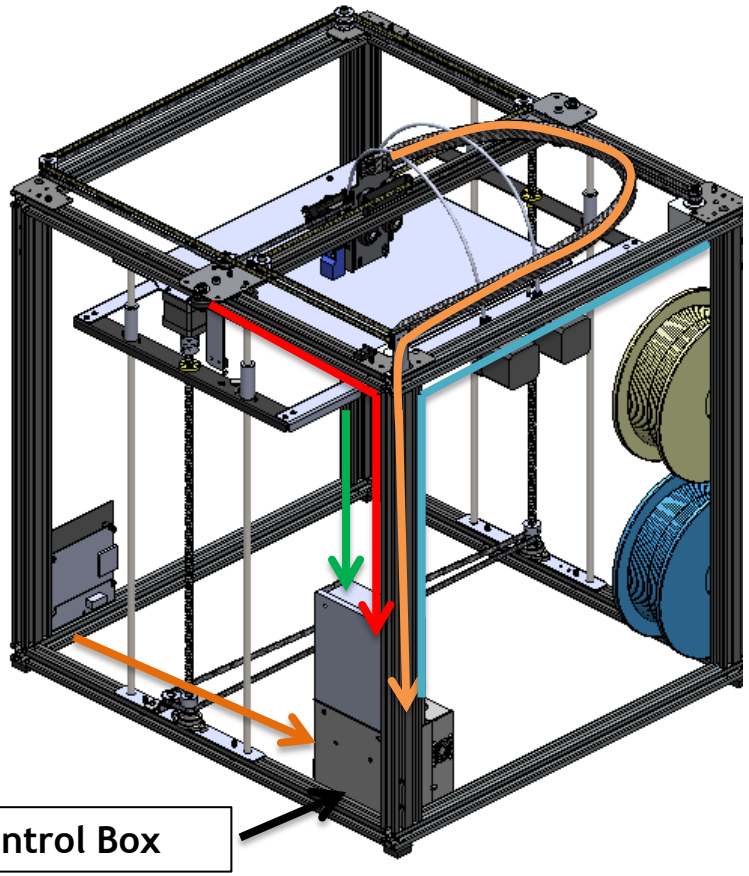
Please use cable tie to wrap the wires when wiring is completed..

If the motor has abnormal vibration or noise, stop working immediately, otherwise it may damage the motor or the motherboard driver module.

Wires layout



TIPS: Insert the wires to the groove of profiles, and then and hide the wires by Plastic Cover



X Motor, Y motor, extrude engine motors cables (Blue) snapped into profile slot and cover it with clips.
Wire lenght: X motor and extrude engine motors are **100CM**, Y motor is **70 cm**.

X- ENDSTOP cable, hotend heater cable, temperature sensor cable, fan cable and proximity sensor cable (Yellow) put in the drag chain. And tie them by wrapping tape when the cables comes out from drag chain.
Wire lenght: **150 cm** of all.
Note: In order to facilitate the cable through the drag chain, the drag chain can be divided into several segments and then connected

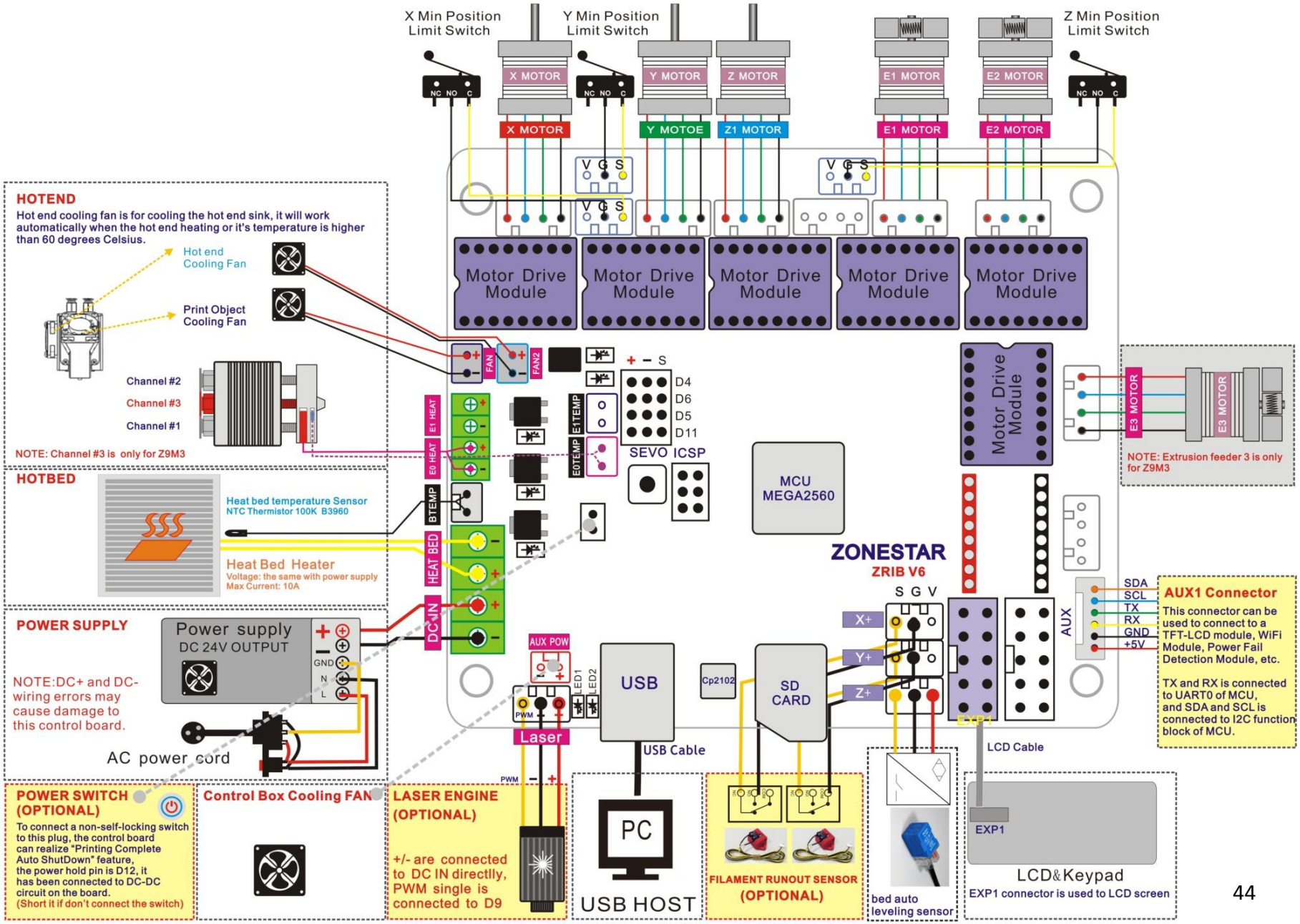
Tie Y- ENDSTOP cable, Z- ENDSTOP cable and Z motor cable(Red) snapped into profile slot and cover it with clips.
Wire lenght: **100 cm** of all.

Tie Hot bed cable(green) **has beed connected to the control board, you just need to plg the connect to the hotbed**

Connect the LCD cable (Brown)to the control board EXP1 connector directlly.

Wire lenght: **60 cm.**

Wiring Diagram



Power supply wiring

WARNING

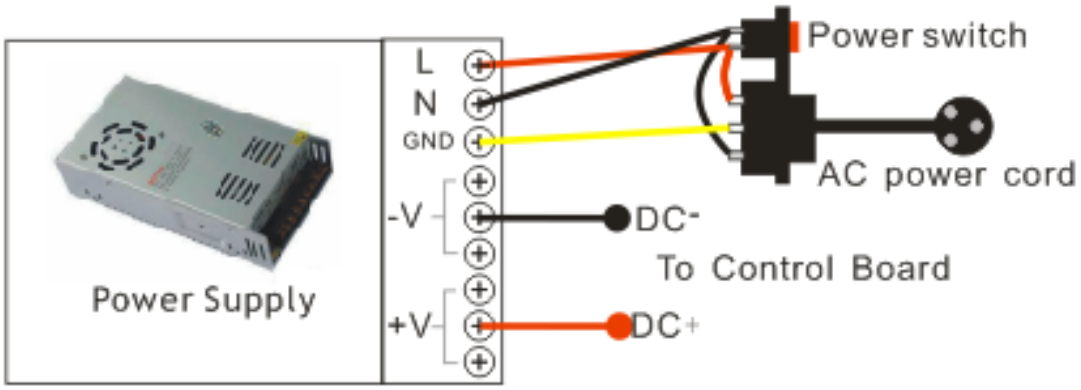
The voltage of power supply is different depending on the countries. Before wiring, please set the power select switch to the correct position.

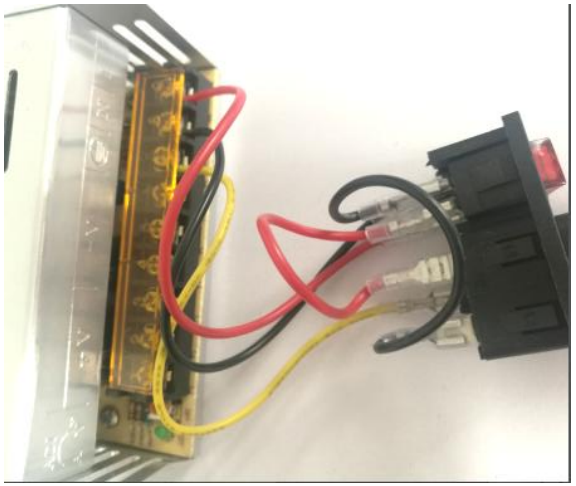
WARNING

Make sure AC power L, N, GND has been connected correctly, otherwise there is a risk of electric shock, damage to the equipment, or malfunction, or may endanger personal safety !

WARNING

Exposure wire is dangerous! Please make sure the wires contact well with terminal.





About motor driver module

WARNING!! Please pay attention to the direction of the motor driver module, incorrect direction will damage the control board!!!!

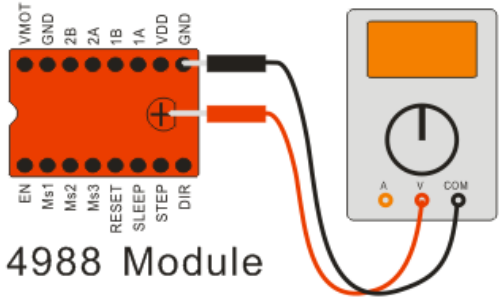
1. For Z9, X Y & Z motors use **4988** driver module, but extrusion motors use **8825** driver module.
2. You may need to adjust the drive current because a couple of reasons, for example, difference of the stepper motors, the hot bed weight, etc., you can rotate the potentiometer on the driver module to adjust the current.

NOTE: Too small drive current may cause lost step or abnormal noise. Too big current may damage the driver module because it is over heat!

Recommended current of stepper motors:

X Y& Z: 0.8A

Extruder: 1.0~1.2A



If you want to adjust the current of the motor driver module, please measure the voltage (**Vref**) on the potentiometer with a multimeter.

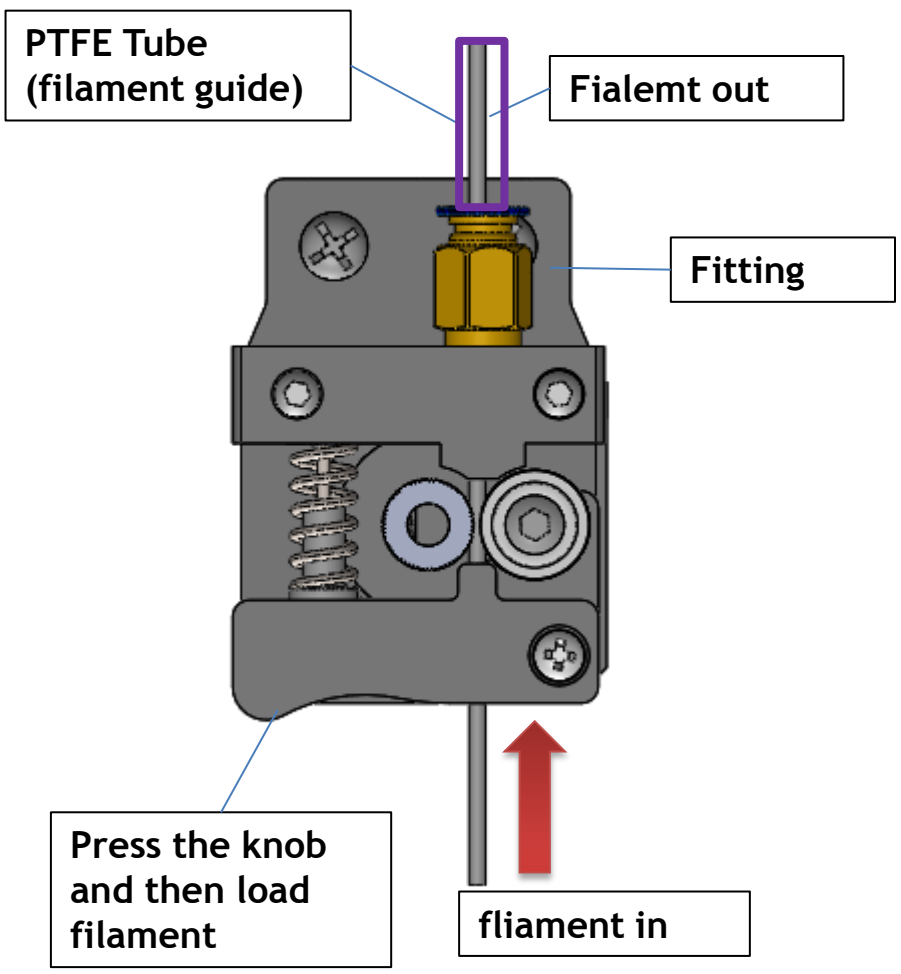
For 4988 driver module:

I motor = Vref * 1 . 25

For X, Y& Z motor, the default value of Vref is 0.6V, don't set this voltage to bigger than 1V, it will may damage this driver module.

For Extrudsion motor, the default value of Vref is 0.5V, don't set this voltage to bigger than 0.8V, it may damage this driver module.

How to load filament to the extrude engine



Step 1: Heating the extruder first (refer to the LCD MENU user guide), and then wait the temperature to over 170 degree.

Step 2: Use clippers to remove the front of the filament.

Step 3: Straighten the front of filament.

Step 4: Press the knob and load filament, please observe whether the fialment enter the PTFE tube. If the filament clog in the fitting, please romve it first and let the filament out, and then install it again.

Step 5: Continue to feed filament until it is enter to the Nozzle, the filament maybe clog when it enter the hotend, please remove the fitting on the hotend and make sure the filament reached to the nozzle, and then install the fitting again.

About Corexy system

1. The Z9 XY drive system uses the Croexy structure. For the principle of the Croexy structure, please refer to the following connections:
   https://reprap.org/wiki/CoreXY
   https://www.corexy.com/theory.html
2. For a Corexy drive system, the X motor and Y motor must work at the same time when the print head move in X or Y axis, and for Z9, the correspondence between the moving direction of the print head and the motor rotation is as follows:

X motor	Y motor	Movement	X motor	Y motor	Movement
+	+	Go HOME in **X axis**	-	+	Go HOME in **Y axis**
-	-	Go Far in **X axis**	+	-	Go Far in **Y axis**

+ : Clockwise rotation **-:** Anticlockwise rotation

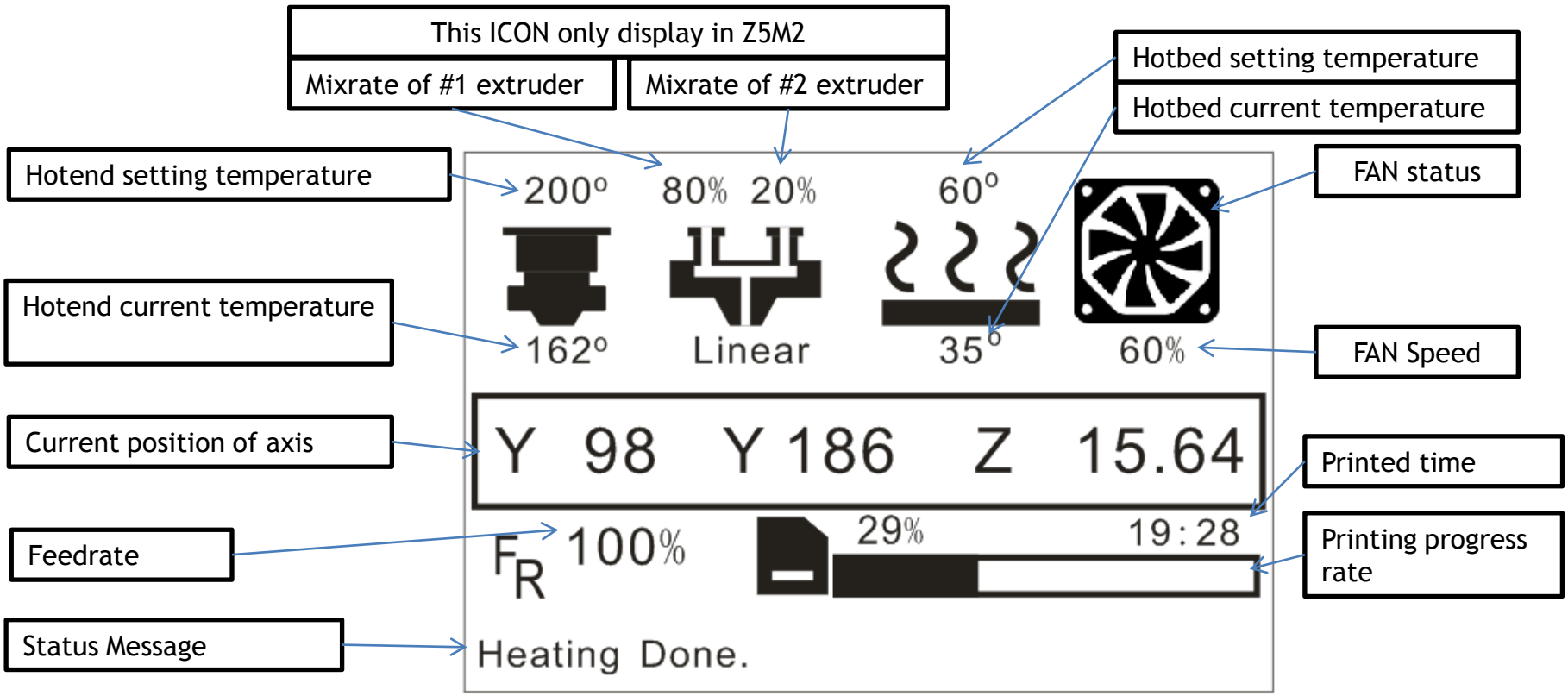
NOTE: Unlike a common machine, the origin of the Z9 is located at the upper right (inner) corner of the machine.

3. **Troubleshootings:**

Appearance of issue	Reasone
Go far when HOME Y	Check if you exchanged the X & Y motor when wiring
The print head is always moving diagonally	1. Check if one of the X and Y motors doesn't work, especially to check if the motor wires don't connect well and drive module doesn't work.
	2. Check if the X and Y motors rotate at the same speed at HOME X. If they are not the same, check the settings of the subdivision pins of the drive module. **Note: We set the Micro-Steps by cutting off the MS pin of the driver module. Pay attention to the settings of the X and Y motor driver modules are the same.**

LCD Menu and Operation

Knob operation: <***Clockwise rotation***>: Next Item / Value +. <***Counterclockwise rotation***>: Previous Item / Value -. <***Push***>: Enter / Execute.



For details on the LCD menu, please refer to the file "LCD Menu Description.pdf" in the SD card.

Prepare to print - level the hotbed

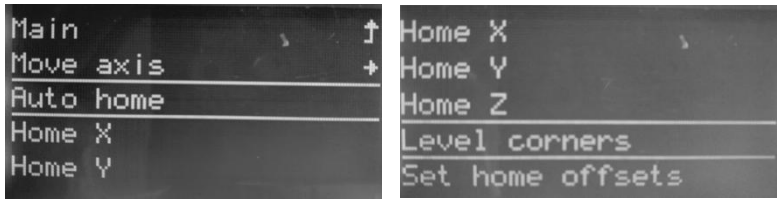
1. Clean nozzle: make sure there aren't any filament at the end of nozzle, if not, remove it by a diagonal pliers.

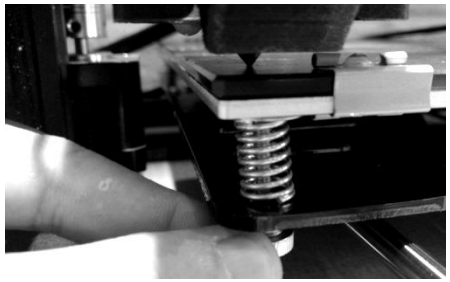
2. Choose “Prepare”>> “Auto Home”>>, wait the hotend go to the orig position.

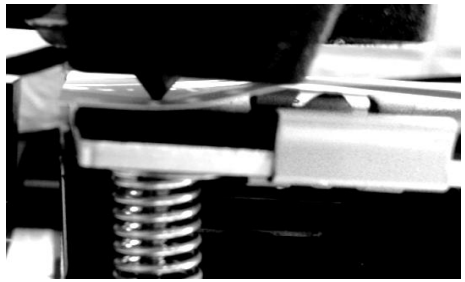
3. Watch the nozzle and make sure the nozzle is higher than the bed, otherwise tighten the hand nuts under the bed to pull down the hotbed or loosen these nuts to move up the bed.

4. Choose “Prepare”>> “Level Corners”>>, the nozzle will go to the first corner, adjust the hand nuts under the hotbed, let the nozzle almost touch the hotbed. In order to get a properly distance, you can put a A4 paper on the hotbed, and when the distanse between the nozzle and hotbed can only insert a paper, it will be perfect.

5. Choose “next corner”, and adjust again. Repeat this step again and again, until all of the four corner at the same height.







Home all axis → **start “level corners” wizard** → **Adjust bed height** → **put a paper on the bed to measure the height**

Prepare to print - Load Filament

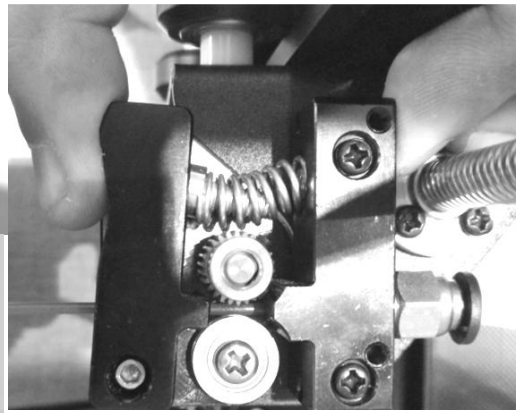
1 Preheat nozzle: Choose “Prepare”>> “Preheat PLA”, then nozzle and hotbed will be heated. **Waiting nozzle temperature reached to setting.**

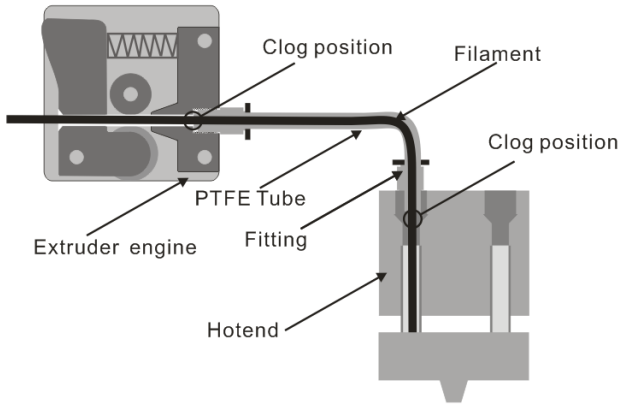
2 ***If there is filament in the hotend, do this step, otherwise skip this step.***
Choose “Prepare”>> “Move axis”>>”Extruder”>>”Move 1mm”>>”extruder: ****mm”, then Clockwise rotate the knob slowly, until you can see the filament flow from the nozzle.

3 ***If there is filament in the hotend, do this step, otherwise skip this step.***
Press the handle on the extrude feeder and pull out the filament.

4 Press the handle on the extrude feeder and insert filament, make sure the filament has been inserted to the hotend.

5 Choose “Prepare”>> “Move axis”>>”Extruder”>>”Move 1mm”>>”extruder: ****mm”, then Clockwise rotate the knob slowly, until you can see the filament flow from the nozzle.





Use a diagonal pliers to cut off the head of filament

Press the handle and insert filament into the extruder engine

When loading filament, make sure it has entered the hotend, if it clog in extruder or hotend, try to remove the fittings and load the filament again.

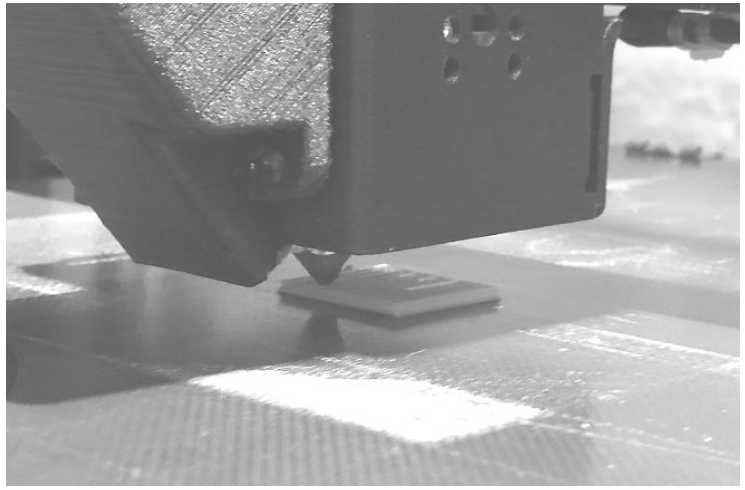
Print a test 3D object (Print from SD card)

1. Insert the SD card to the SD card socket on the control box, and then power on the control box.
NOTE: the touchpad of Micro SDcard pointing up

2. Choose “Print from SD”>> Choose “Test_gcode\Single Color\xyz_cube.gcode”, push the knob to start printing.

3. Wait the printer to finish heating and start to print, watch the distance from nozzle to bed, double click the knob of LCD menu and set the z offset if the distance is not perfect, let the filament can stick on the hotbed well.

4. You need to print a filament roll dock by yourself, please find “**Spool_ZSD_V2.*gcode***” file in SD card and print it out.



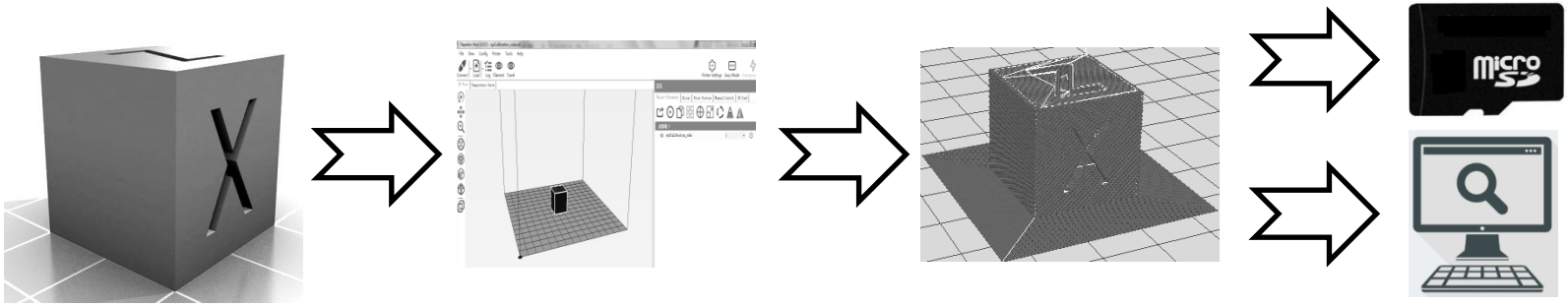
Insert SD card to control box and then start to print

Adjust z offset if the filament can't stick to bed well

Wait for printing finish!

Slicing, control and printing from PC HOST

1 *Before building a 3d object by using this 3D printer, you need to use a software to convert the 3D models (stl, obj, etc., depending on the type of slicing software) into a machine-recognizable file - **gcode file**. This process is called **"slicing"**.*



2 *Our recommended slicing and HOST software is **repetier-host**, which is a free software, you can also use any other software to slicing the 3d model as long as it can support reprap protocol, for example: Cura, slic3r, KISSlicer, pronterface, simplify3d etc.*

3 *For more about slicing, please refer to the document in the SD card, directory: **"2. Operation Guide\Slicing Setting"**. Y*ou can also download the latest document from our cloud disk:
If you want to control the printer from PC HOST, we store the guide in SD card, please find it out and read it.