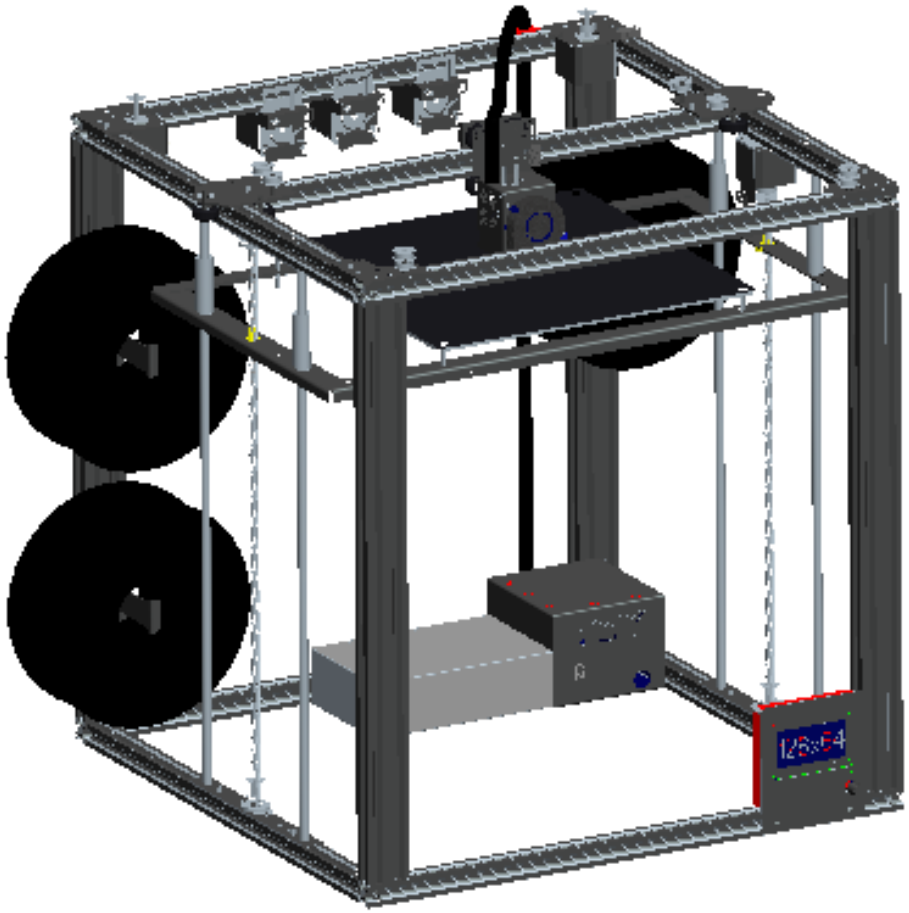
ZONESTAR



Model: Z9 Serial 4th 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.

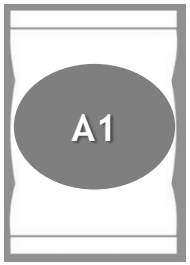
Caution: Hot!
Hotbed has high temperature even the printer stop working.

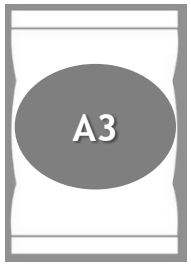
Please keep well-ventilated condition! May produce toxic gases when printer working.

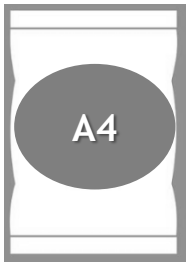
Please make sure you have set the AC power select switch to the correct position before power on.

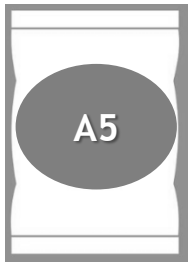
For mixing color printer, must load filament to both of the extruders, even if you print single color 3D object.

Parts









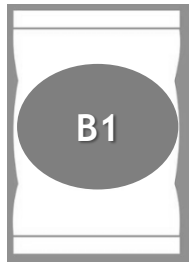


Fig	Name	Description
A1	Metal brackets	1. X-axis motor bracket 2. Y-axis motor bracket(with ENDSTOP) 3. Filament roll dock
A2	Screws	Screws for assembled
A3	Other parts	1. Closed timing belt for Z-axis synchronize 2. Open timing belt for X and Y axis 3. Timing pulley for X,Y and Z-axis 4. Filament guide tubes and fittings 5. Cable ties 6. Rubber Pads
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

Parts

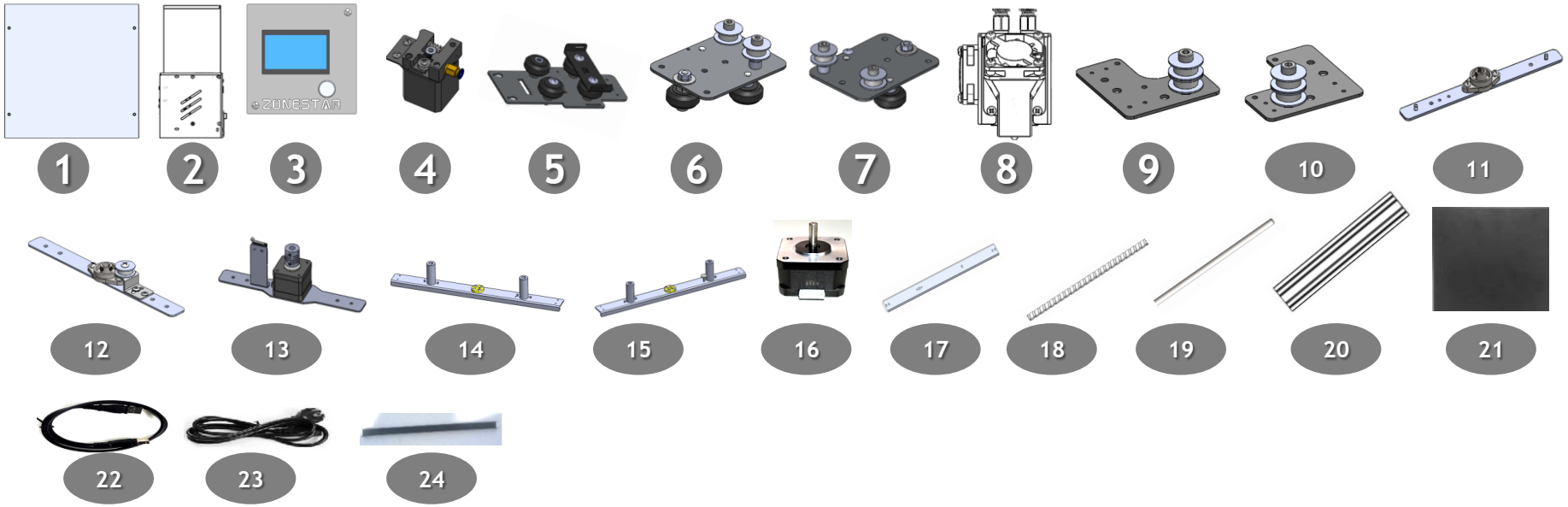
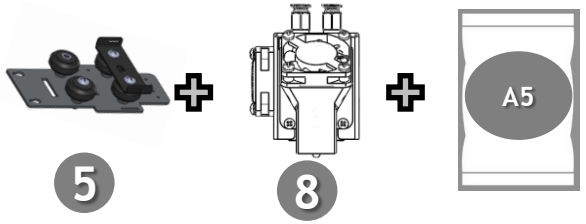


Fig	Name	Qty.
1	Hot Bed	1 PC
2	Control box	1 Set
3	Control Panel	1 Set
4	Extrusion feeder	2/3/4(*)
5	X Carrier	1 Set
6	Y Carrier -left	1 Set
7	Y Carrier-right (with a screw on the top)	1 Set
8	Hotend	1 Set
9	belt bracket - left	1 Set
10	belt bracket - right	1 Set
11	Left Z slider-rod bracket	2 Set
12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

Assemble hotend module



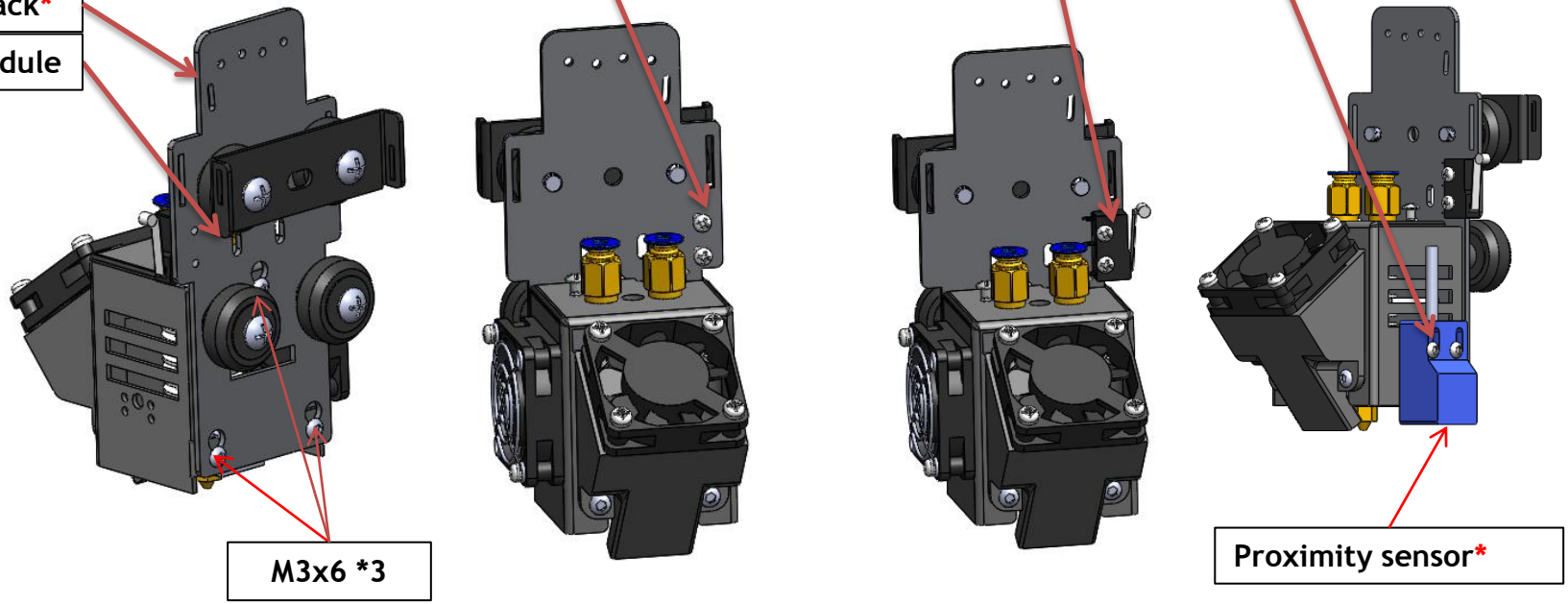
Hotend_back*

Hotend module

Disassemble these two screws

Install X endstop

PM3x20



M3x6 *3

Proximity sensor*

1. Install hotend module to the bracket

2. Disassemble X ENDSTOP fixed screws

3. Tighten the screws to install the X ENDSTOP

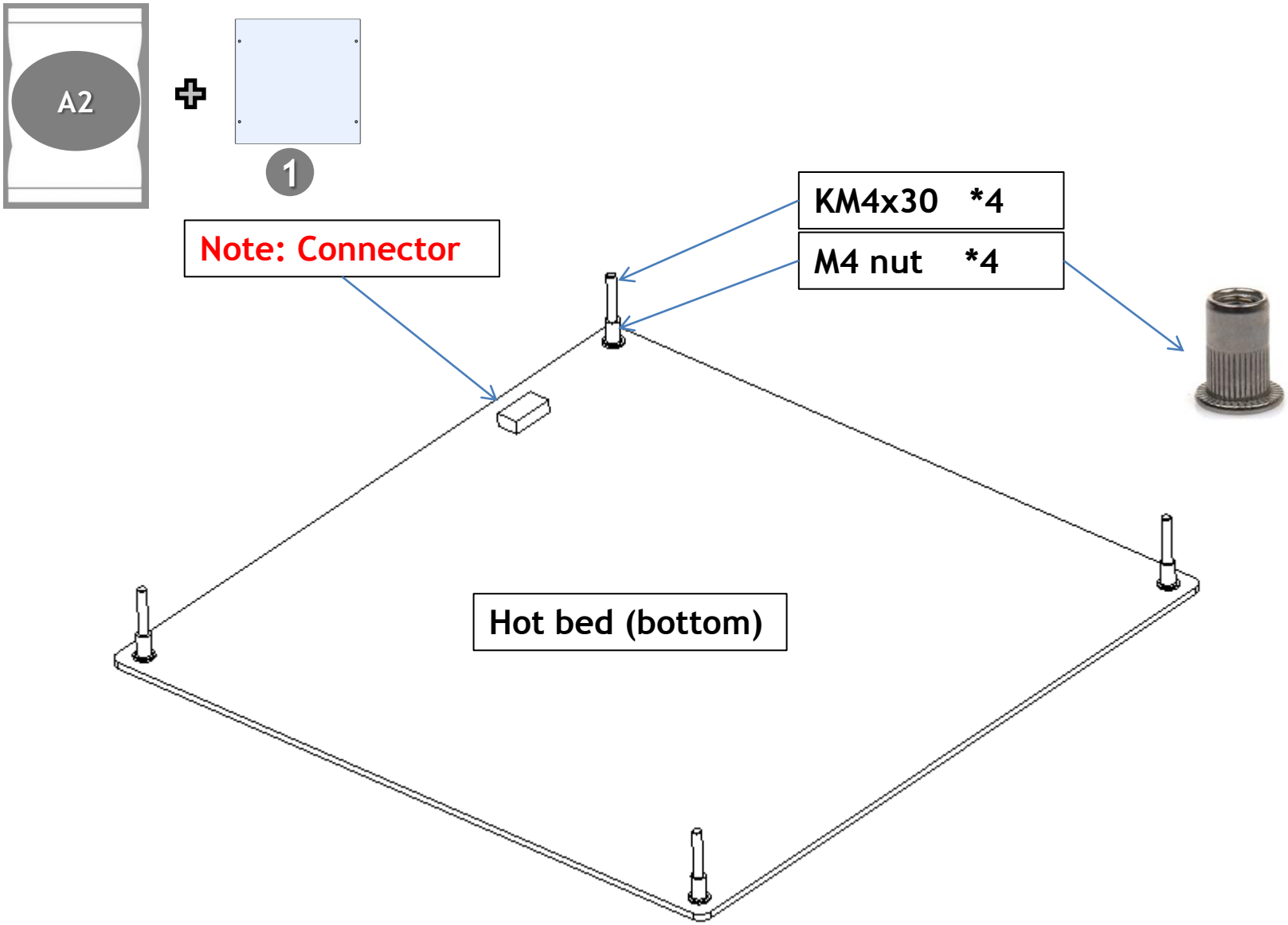
4. Install proximity sensor

NOTE 1: Don't install the proximity sensor in this step, about the detail, please refer the guide of "*How to upgrade bed auto leveling*"

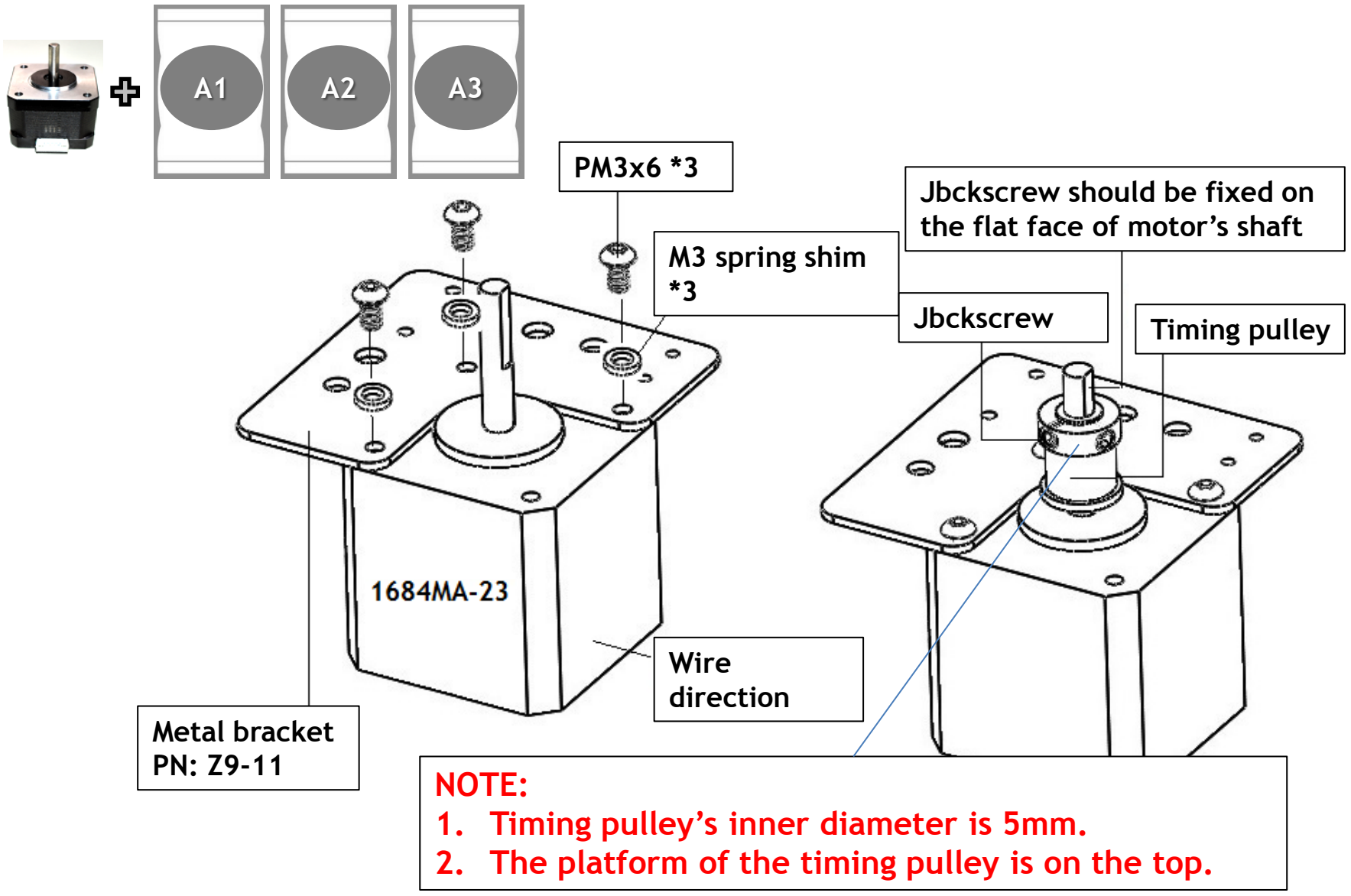
NOTE 2: Hotend Bracket shell maybe a little different with the picture,

ZONESTAR

Assemble hot bed



Assemble X drive components



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

Assemble Y drive components

A1 A2 A3

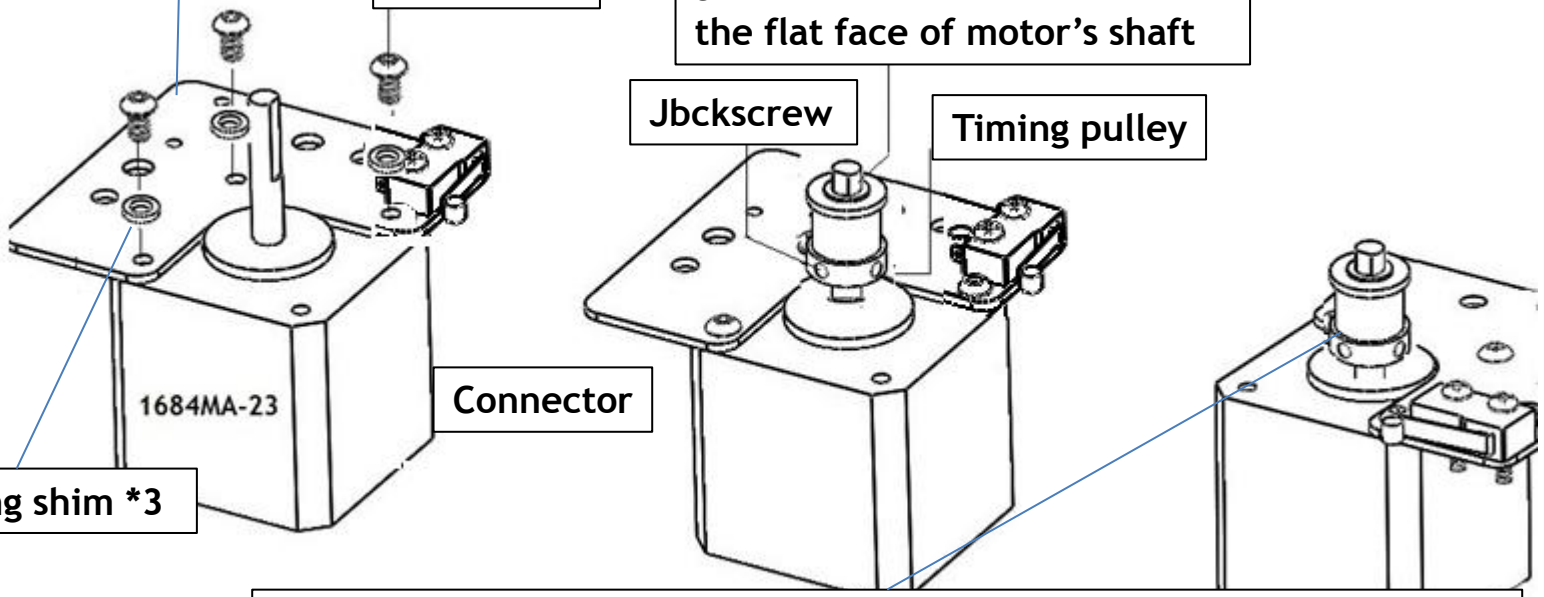
Metal bracket
PN: Z9-11

PM3x6 *3

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

Jbckscrew

Timing pulley



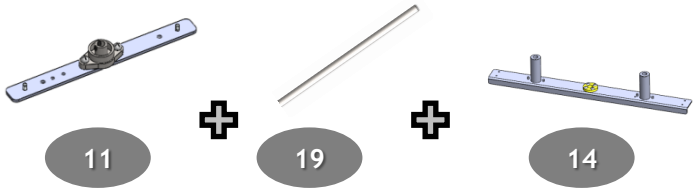
Connector

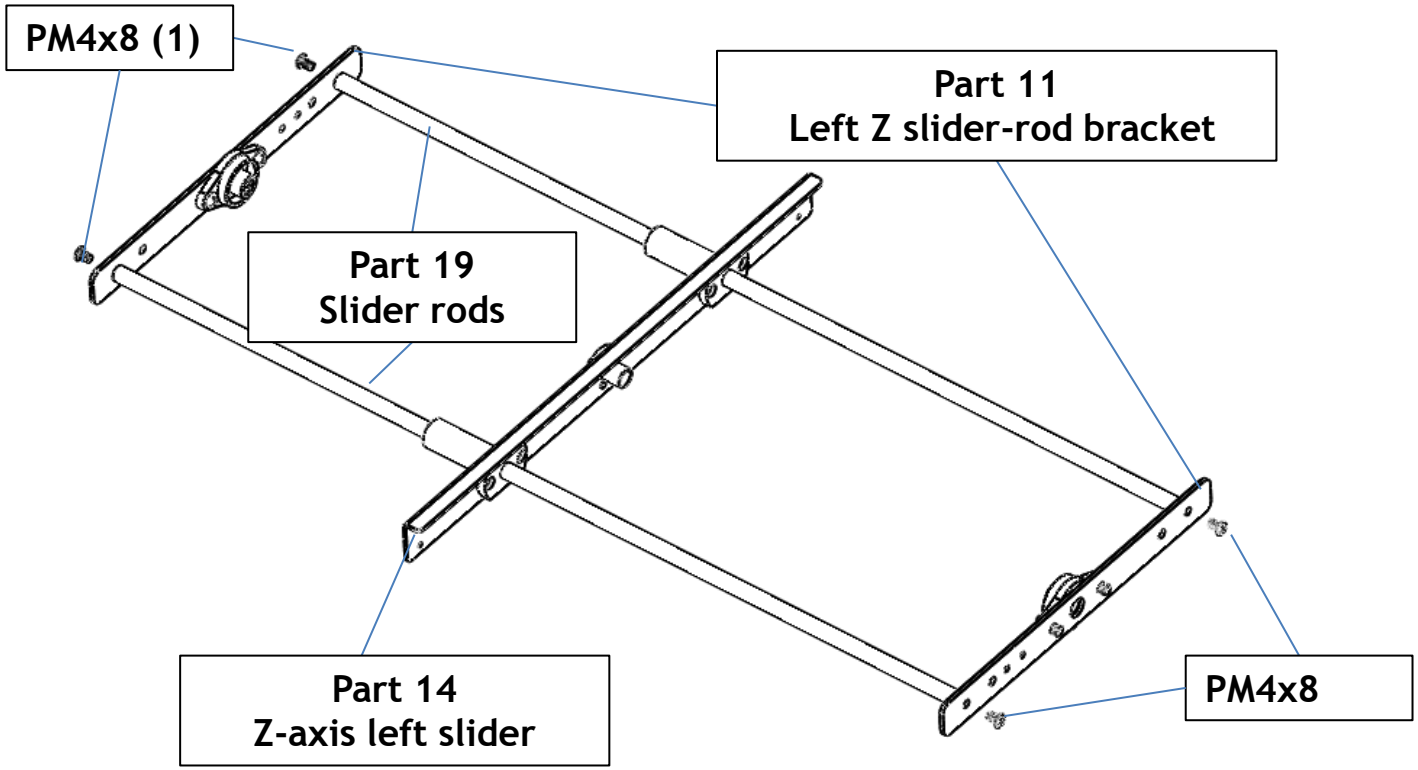
M3 spring shim *3

NOTE:

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

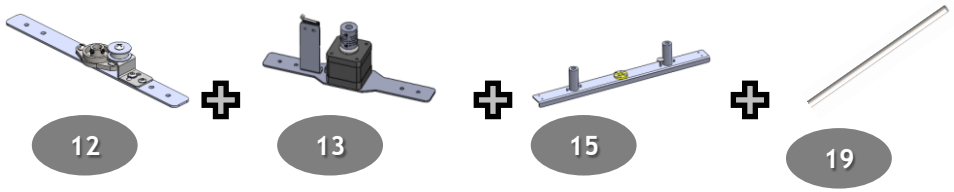
Assemble Z axis drive mechanism- left

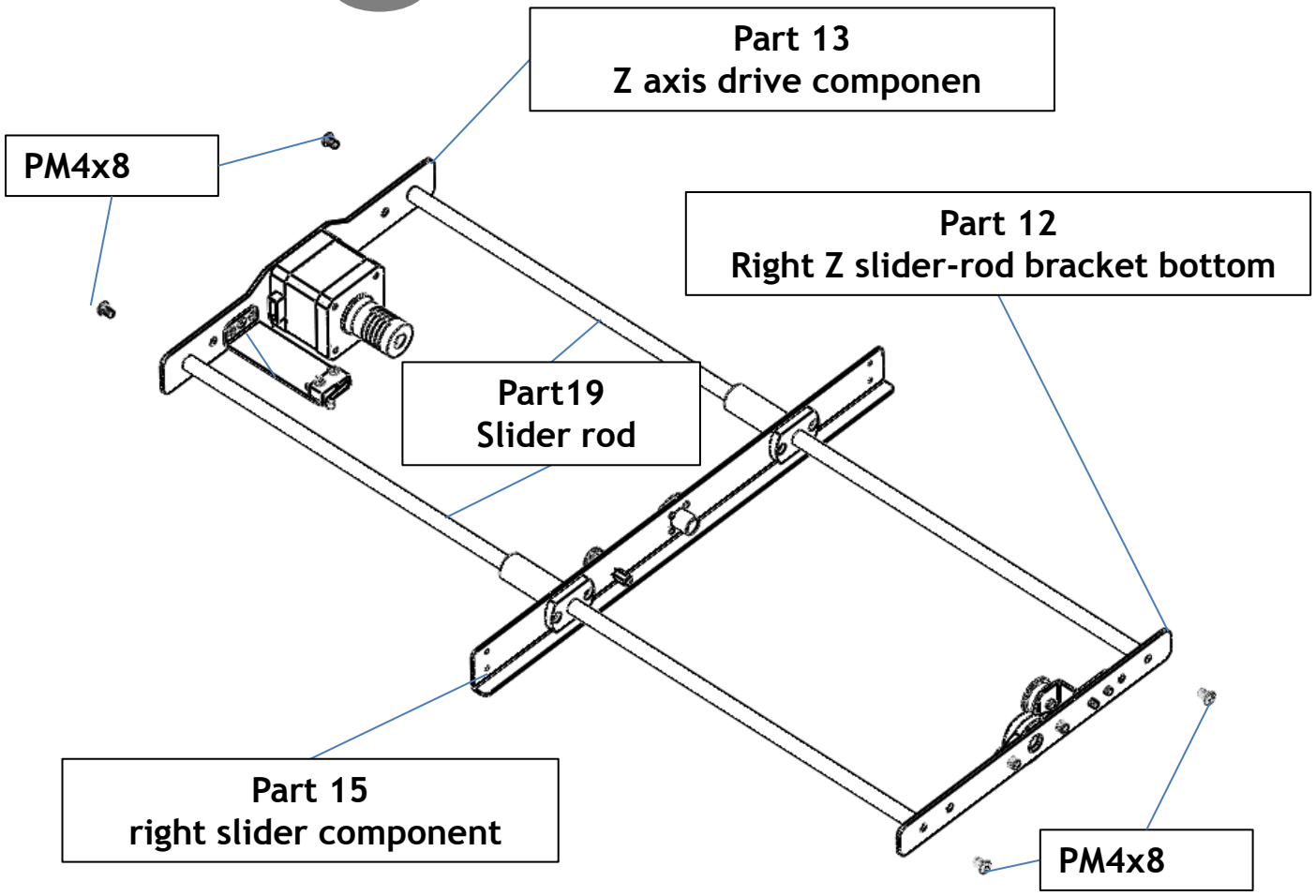




NOTE: Disassmbled the PM4x8 screws from end of the rods before installed it.

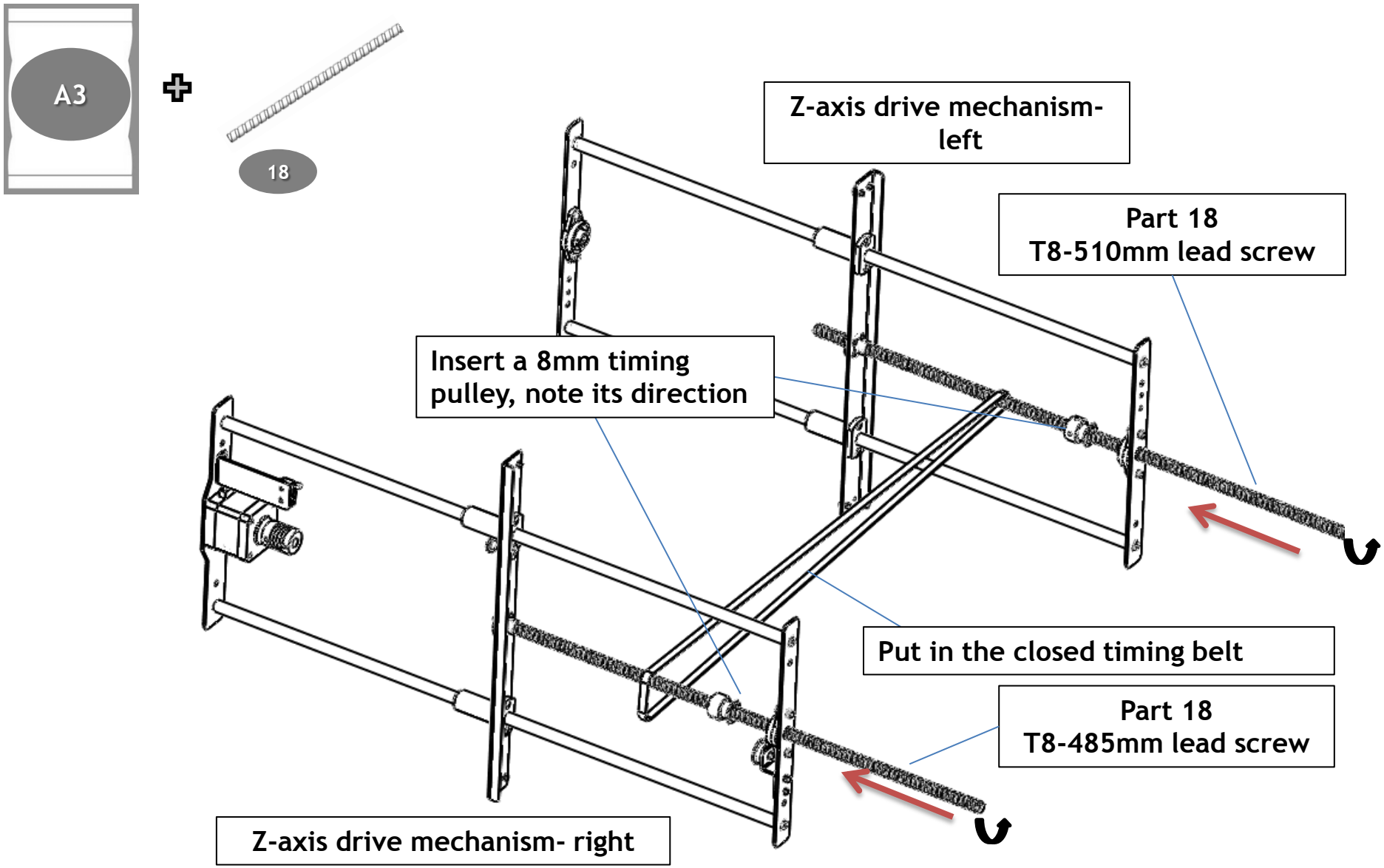
Assemble Z axis drive mechanism- right





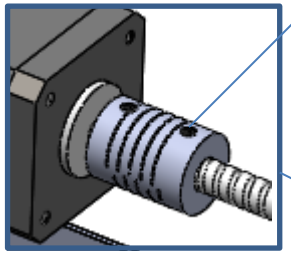
NOTE: Disassmbled the PM4x8 screws from end of the rod first before installed it.

Assemble Z axis drive mechanism



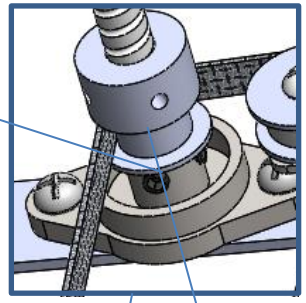
Assemble Z axis drive mechanism

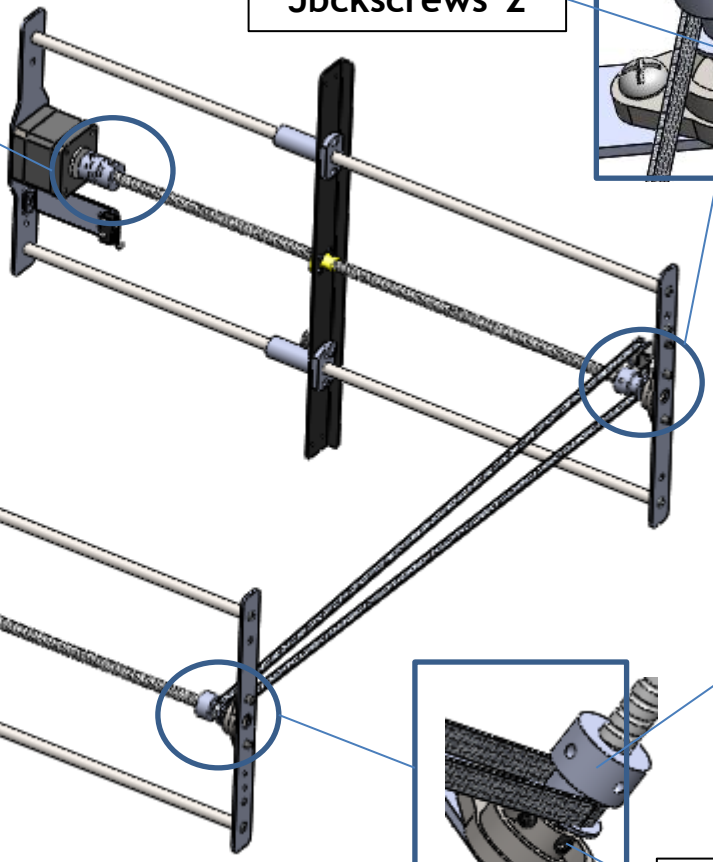
Jbckscrews*4



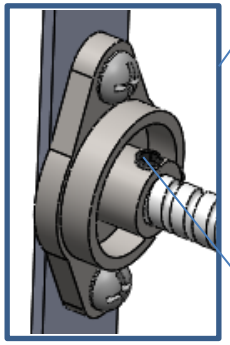
Spin in the lead screw and lock the jbckscrews

Jbckscrews*2





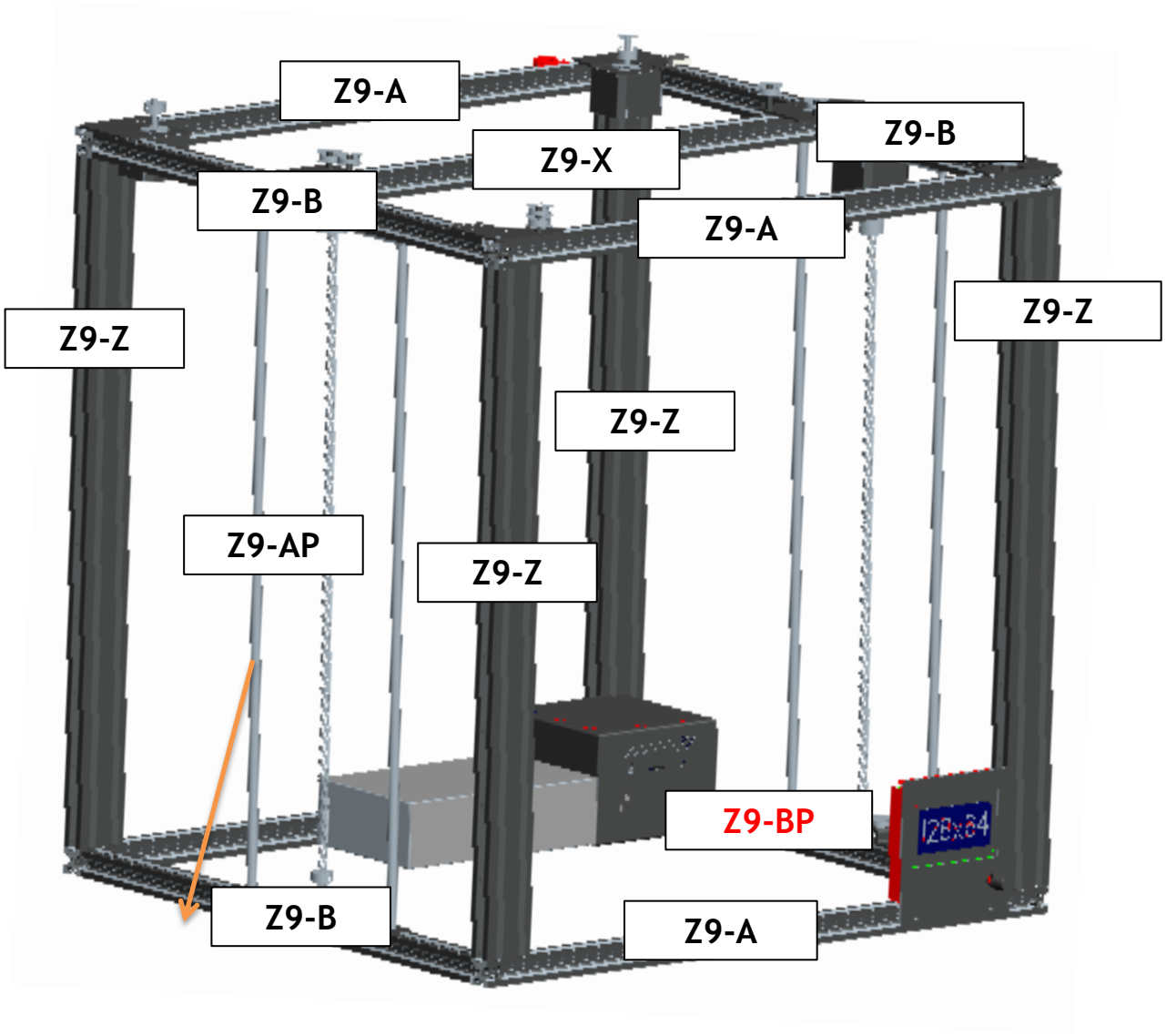
move the timing pulley to the bottom and lock the jbckscrews



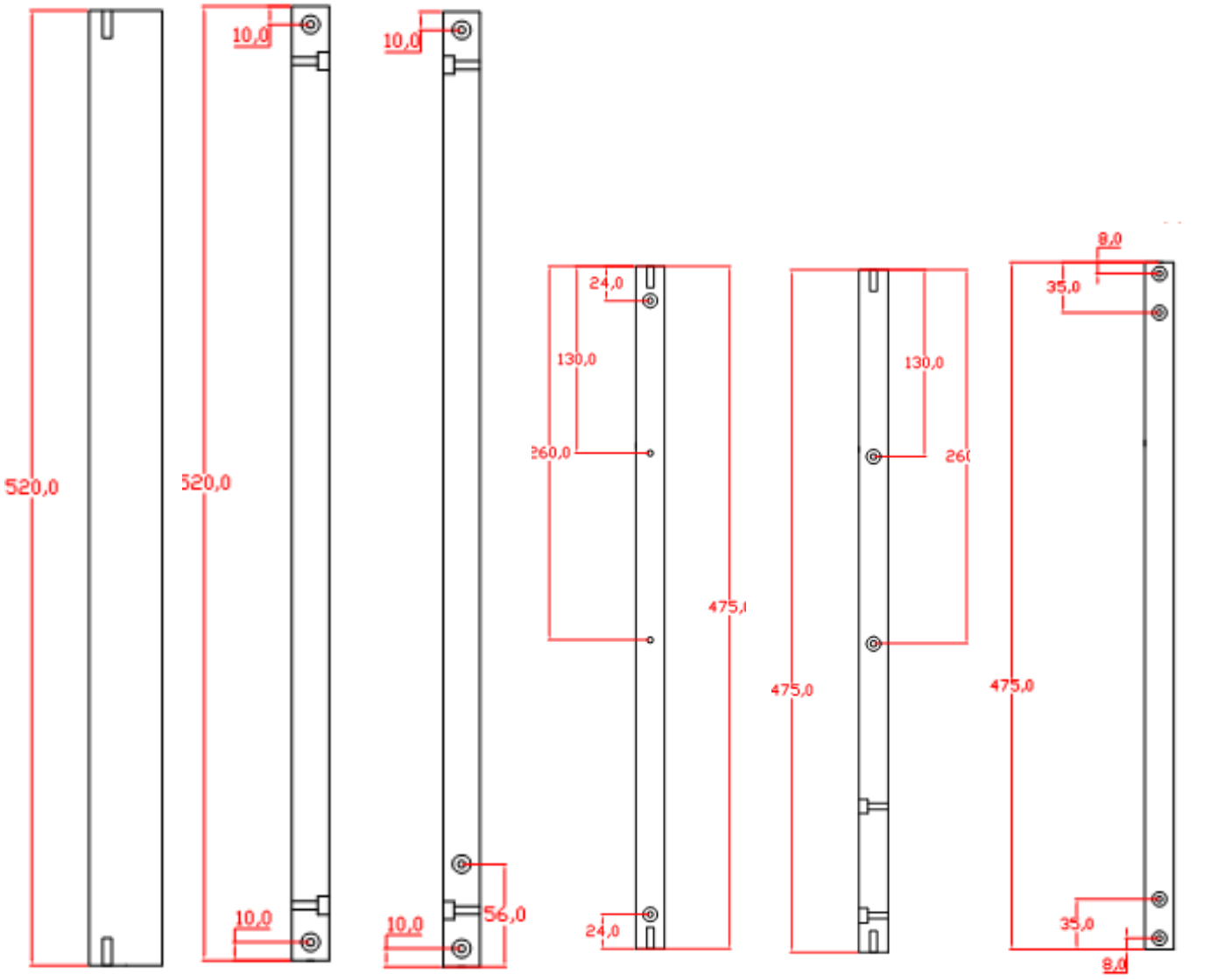
Tighten the jbckscrew to lock the lead screw

Jbckscrews*2

Aluminum profile preview

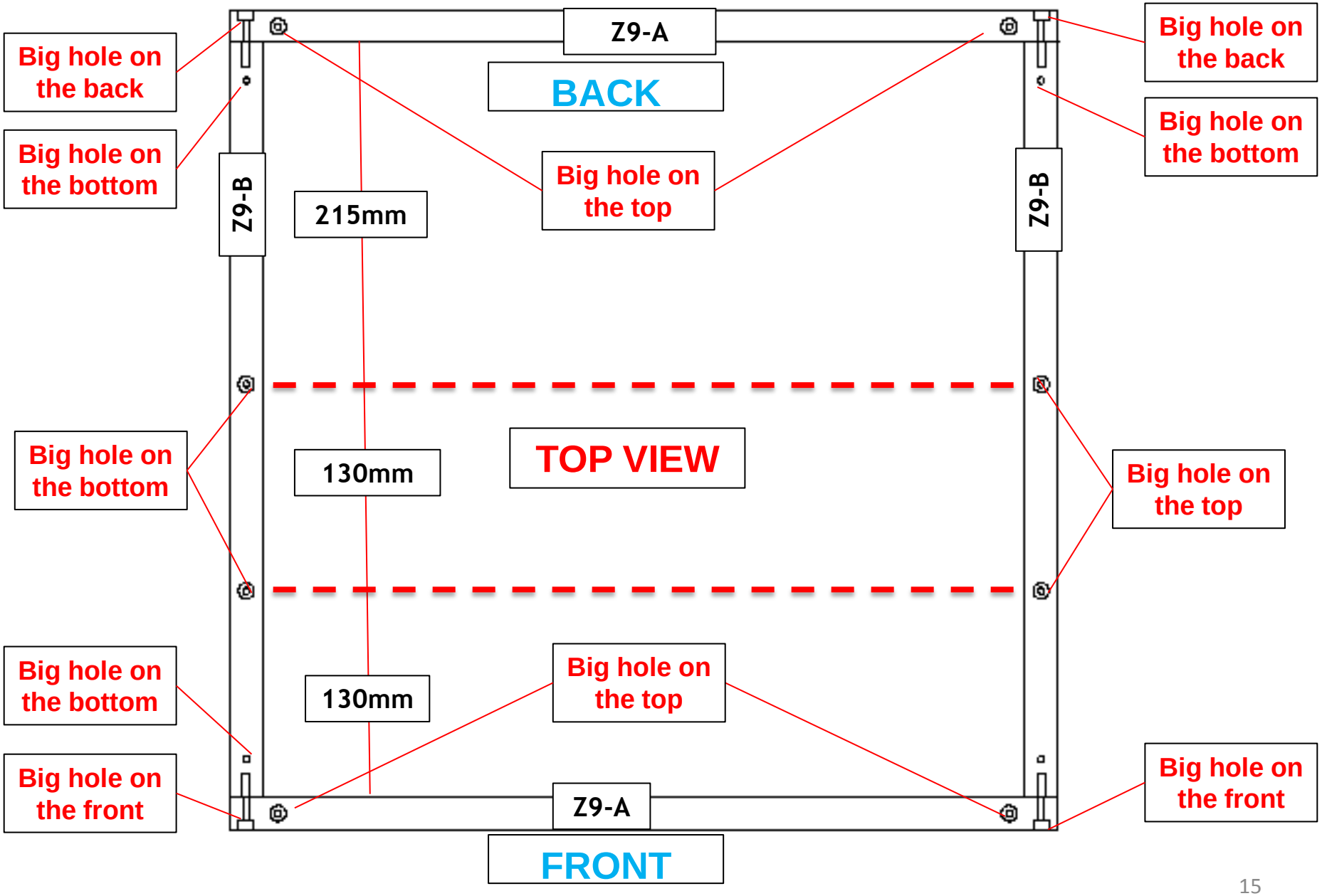


About aluminum profiles



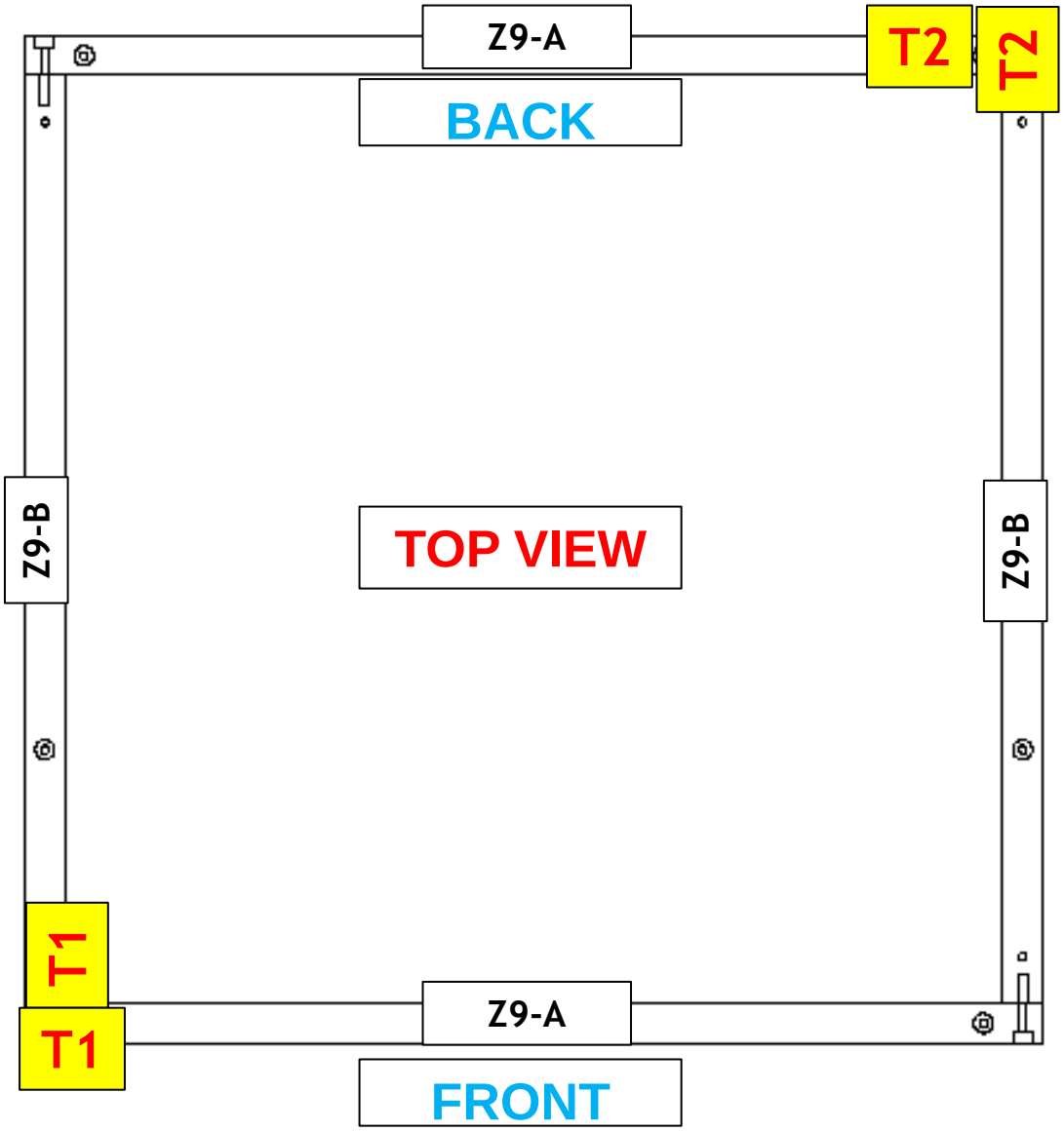
Z9-Z 4PCS	Z9-A 3PCS	Z9-AP 1PCS	Z9-B 3PCS	Z9-BP 1PCS	Z9-X 1PCS

Top aluminum profiles

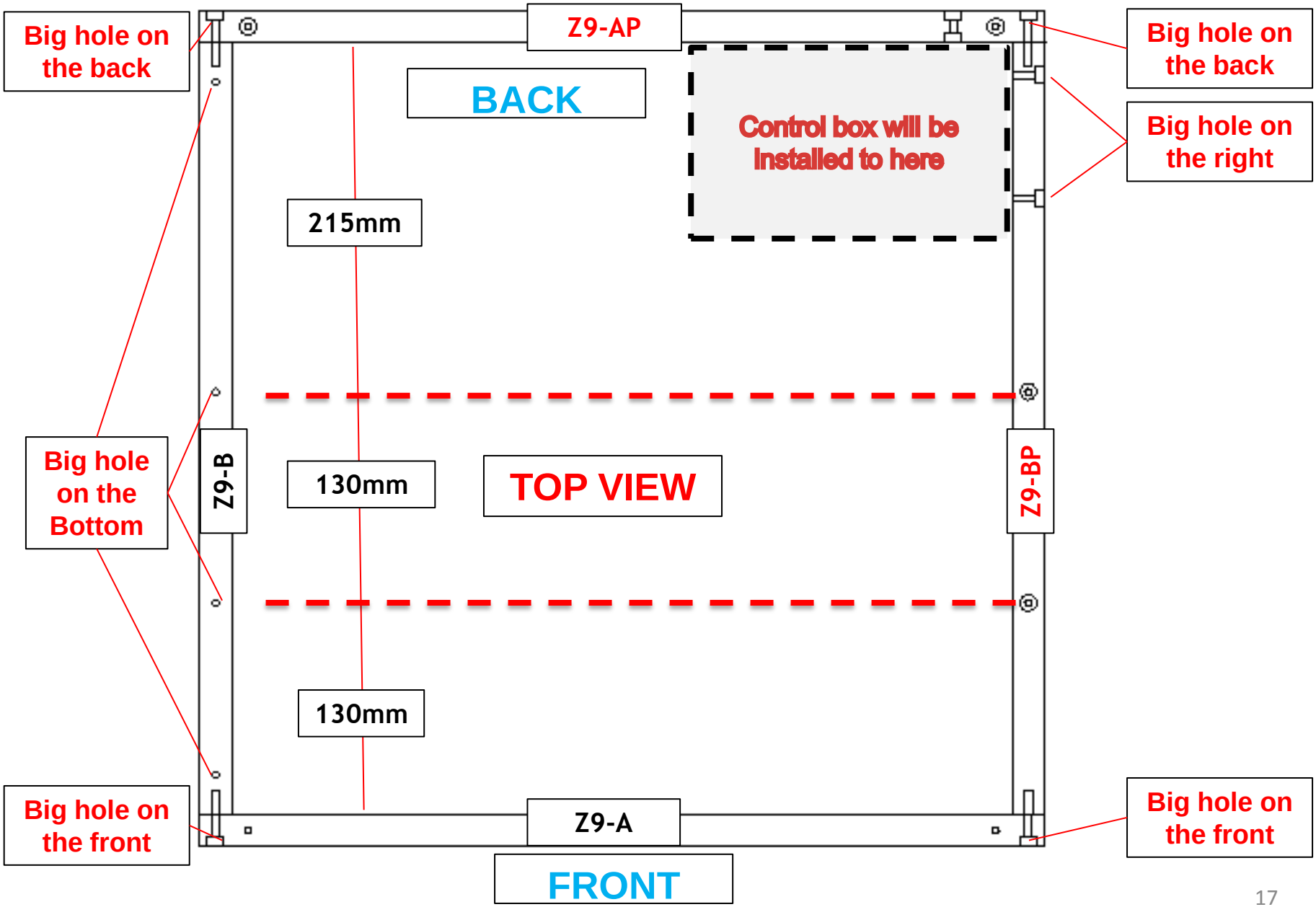


How to layout the profiles (TOP)

Find the profile with T1 and T2 stickers and place the profiles as below.

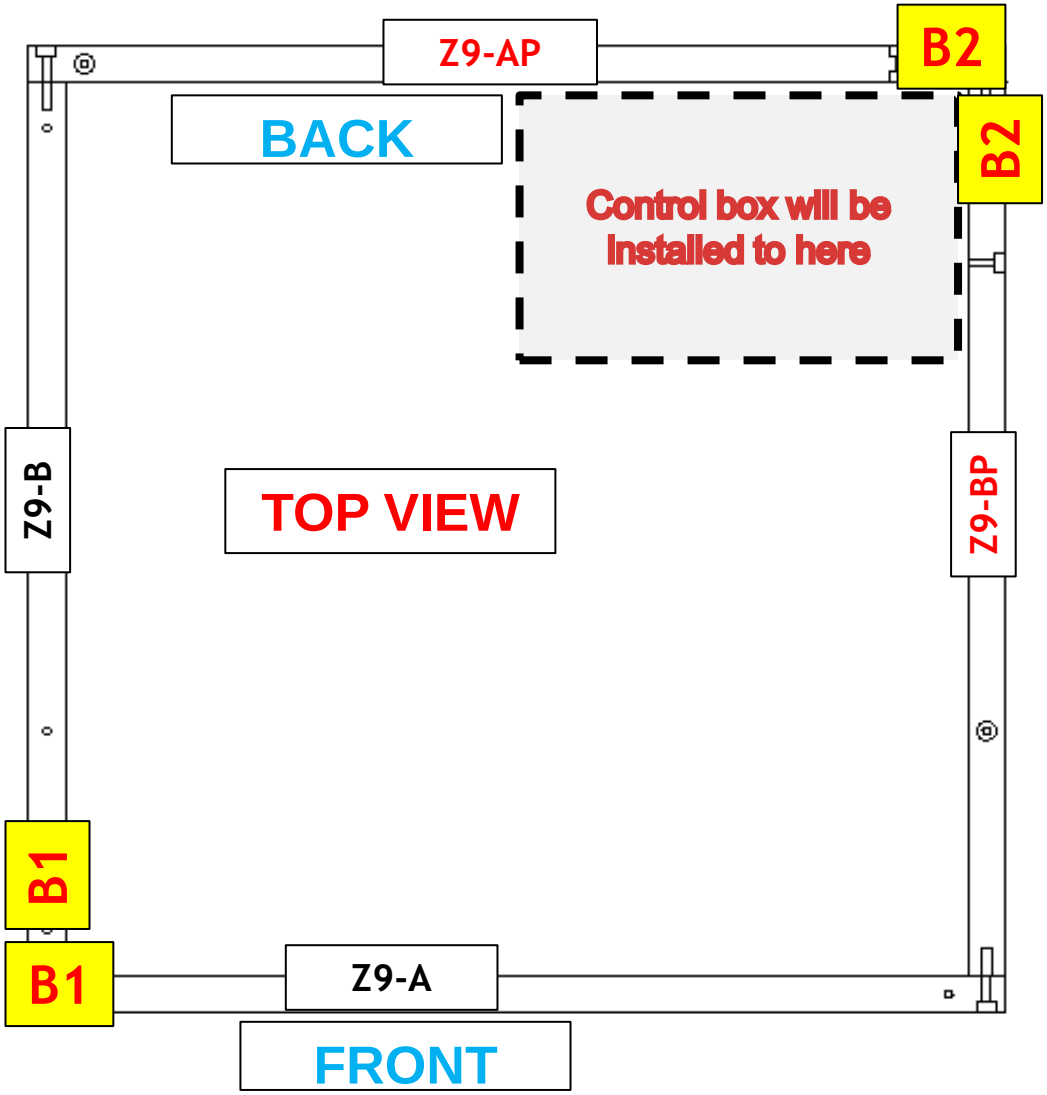


Bottom aluminum profiles

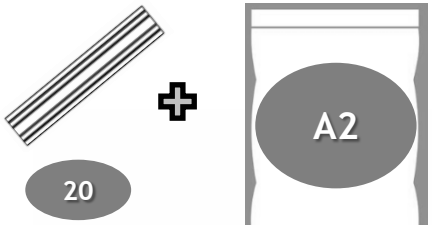


How to layout the profiles (BOTTOM)

Find the profile with B1 and B2 stickers and place the profiles as below.



Top aluminum profiles frame assemble



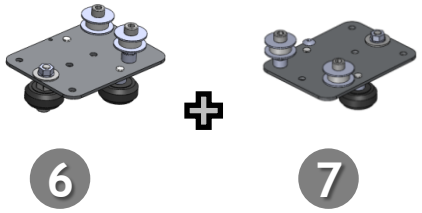
Z9-B

HM5x20 *2

Z9-B

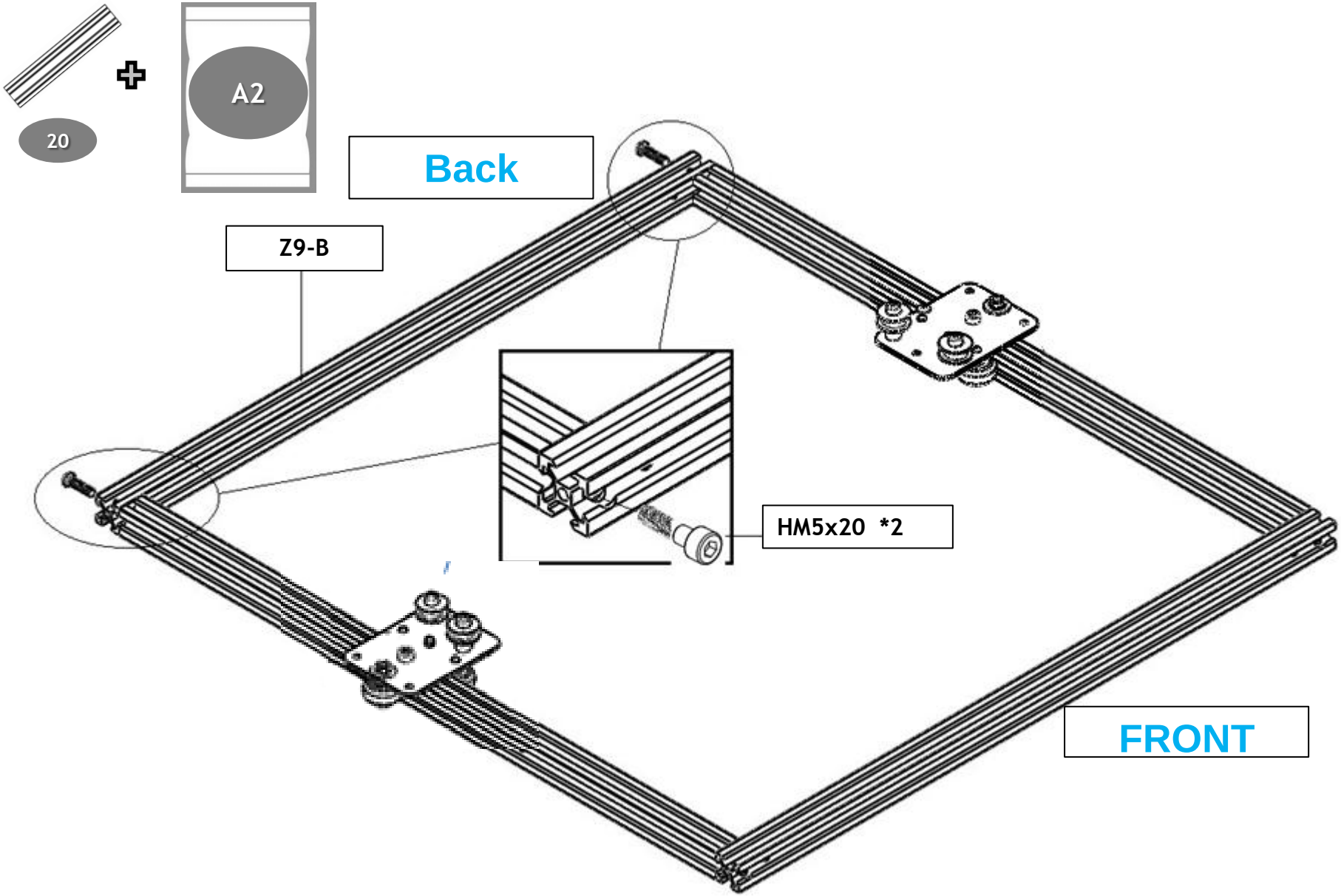
Z9-A

Install X Y carrier to top aluminum profile frame

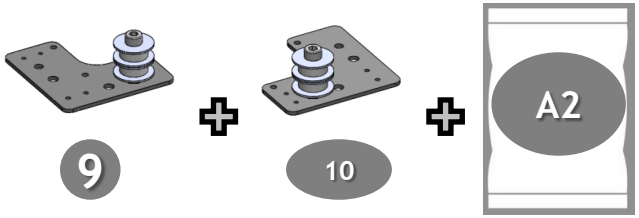


NOTE 1: Adjust the eccentric column with a wrench, let the carriers hold the rail well and move smoothly.
NOTE 2: The carriers shell maybe a little different with the picture.

Assemble top aluminum profiles frame



Install X Y bearing bracket



Y Carrier - right

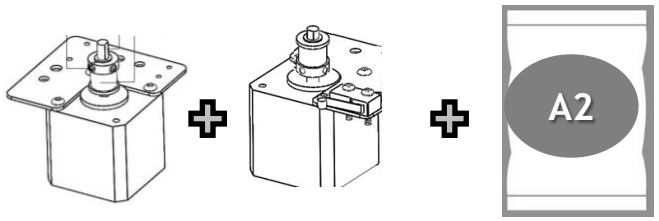
Y bearing bracket

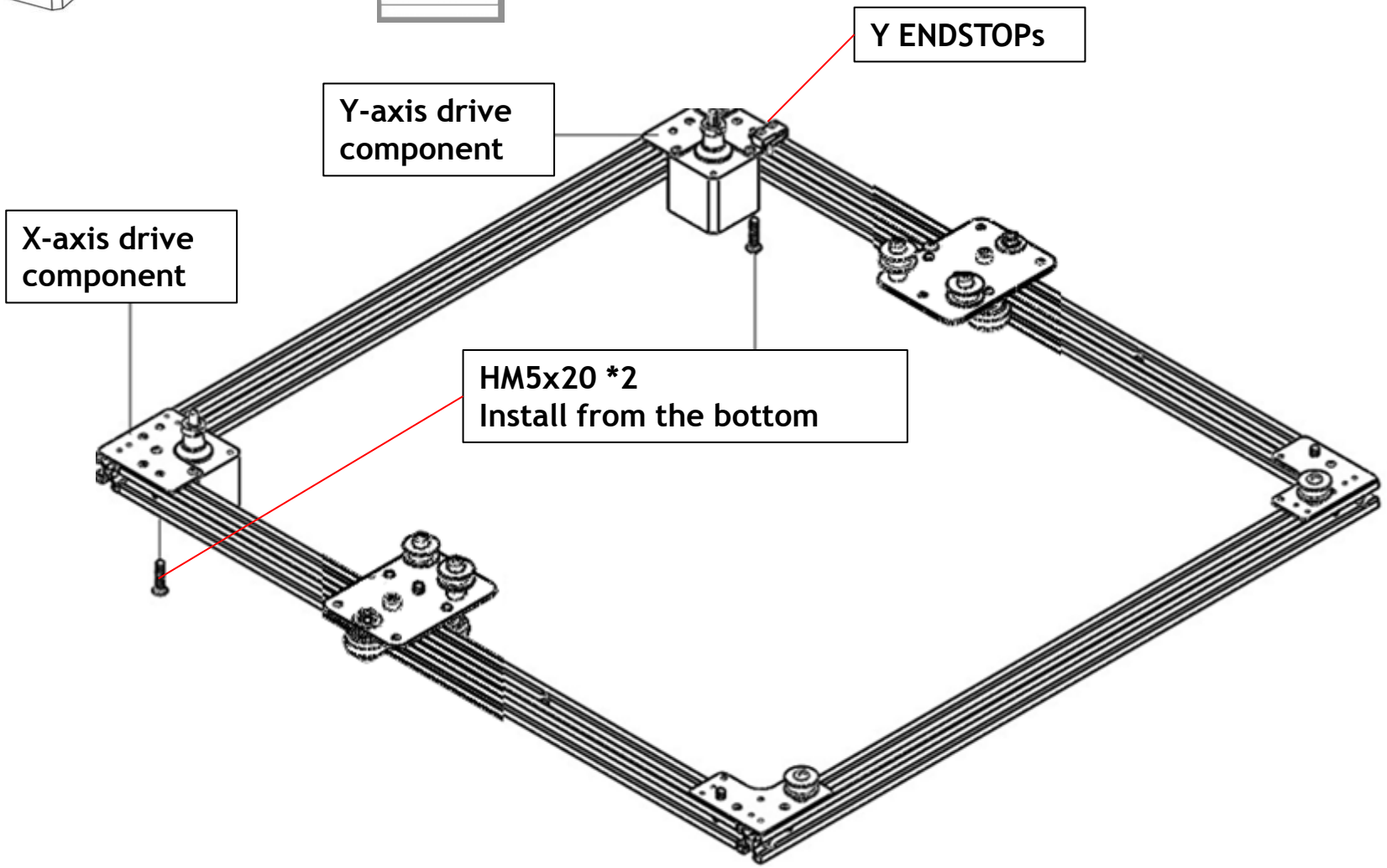
Y Carrier - left

X bearing bracket

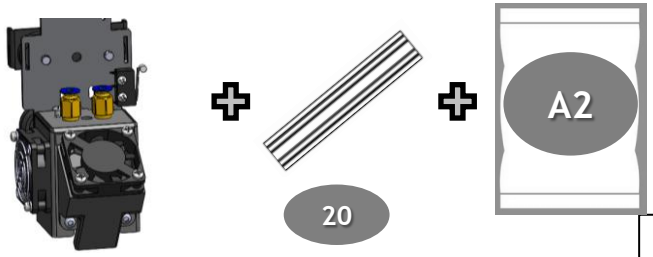
HM5x20 *2
Install from the bottom

Install X and Y drive components

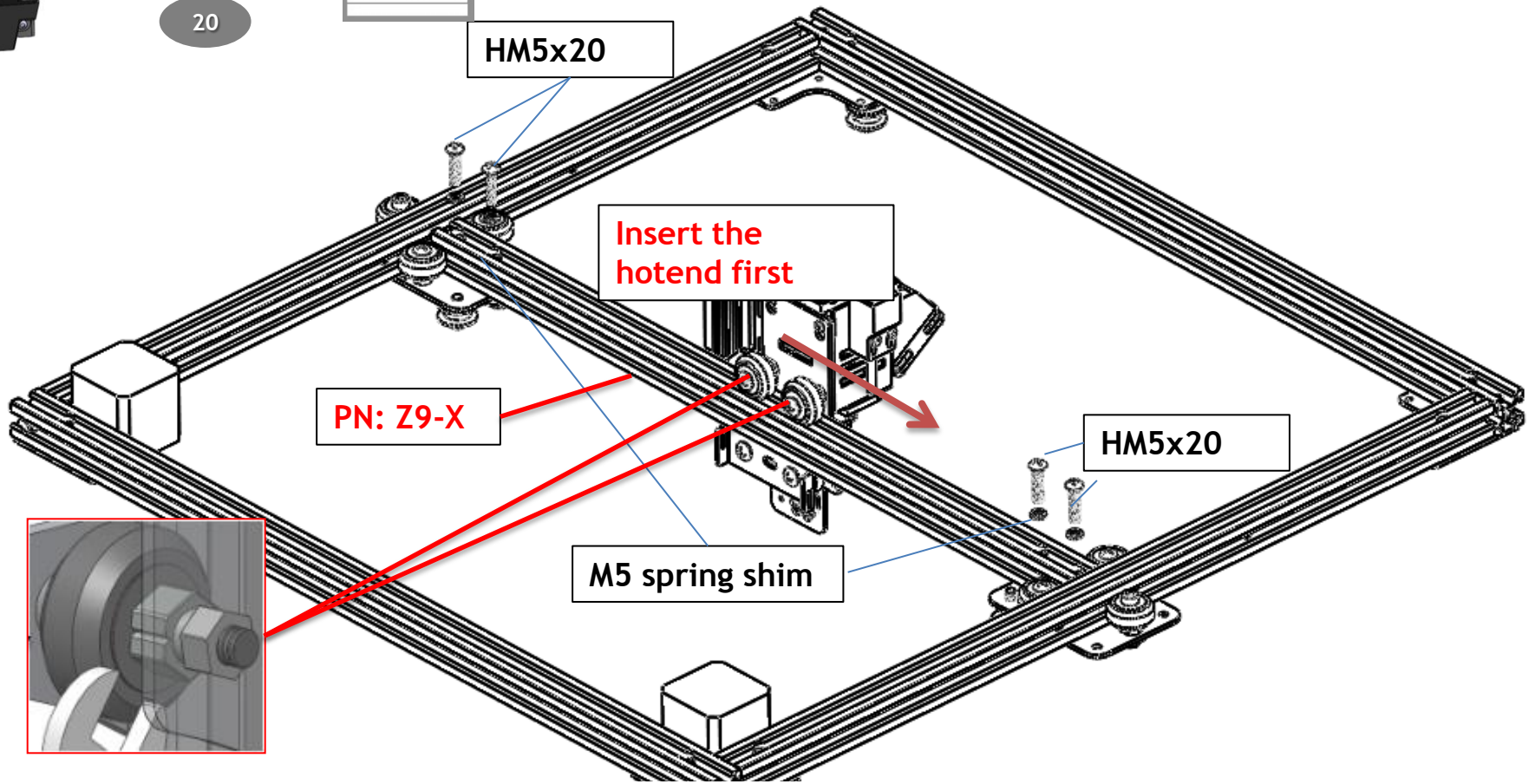




Assemble X-axis mechanism

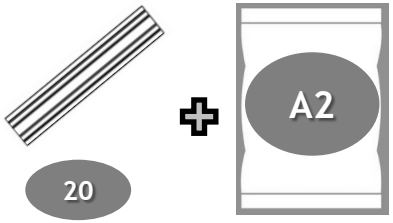


Bottom view



NOTE 1: Adjust the eccentric column with a wrench, let the printhead hold the rail well and move smoothly.
NOTE 2: The printhead bracket shell maybe a little different with the picture.

Bottom aluminum profiles frame assemble



Z9-AP

Z9-BP

Back

HM5x20 *4

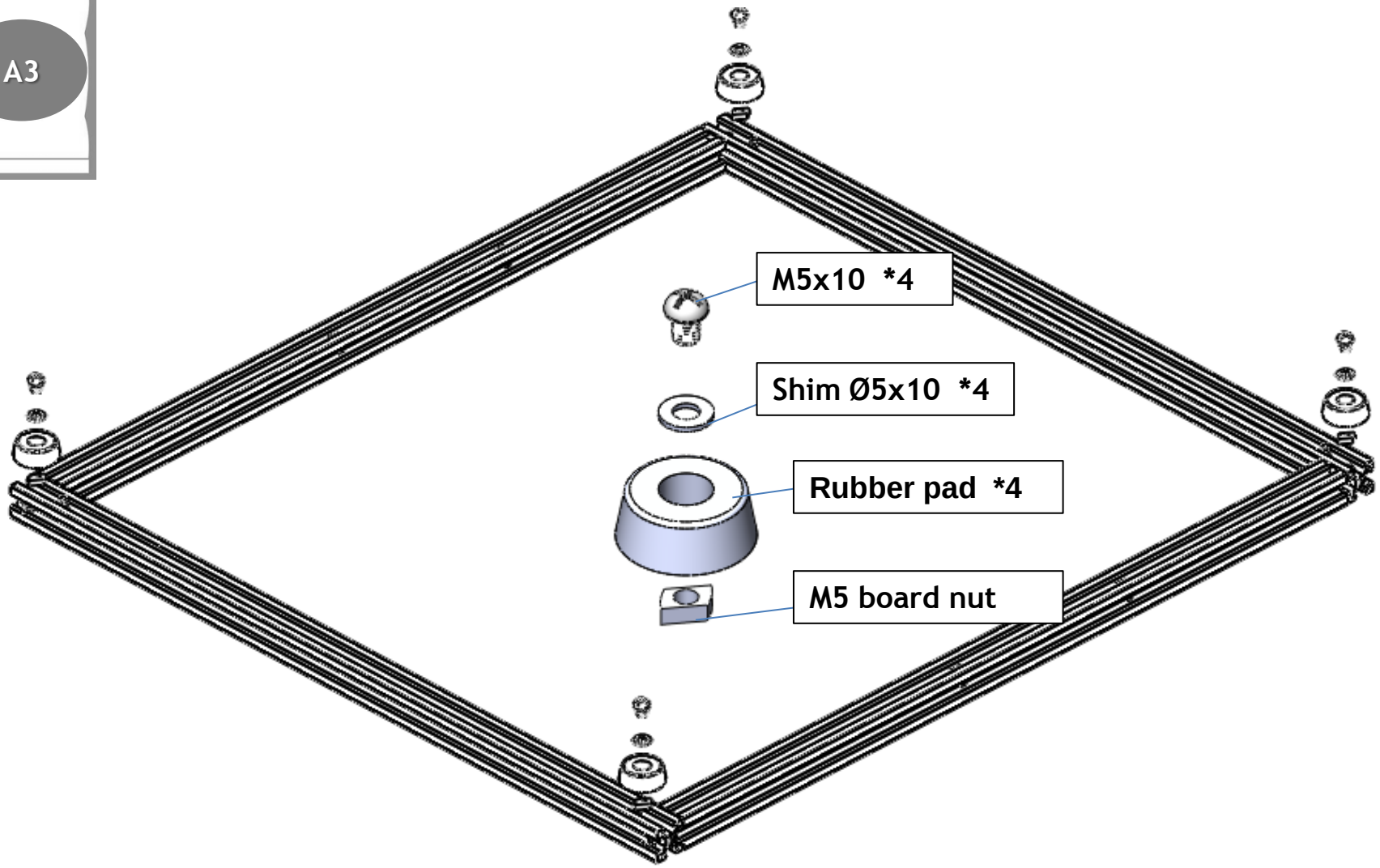
Front

Z9-B

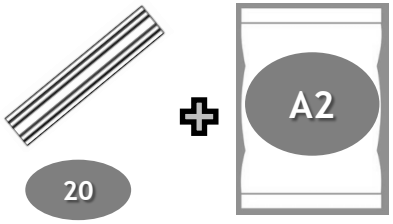
Z9-A

Install Rubber pads

A3

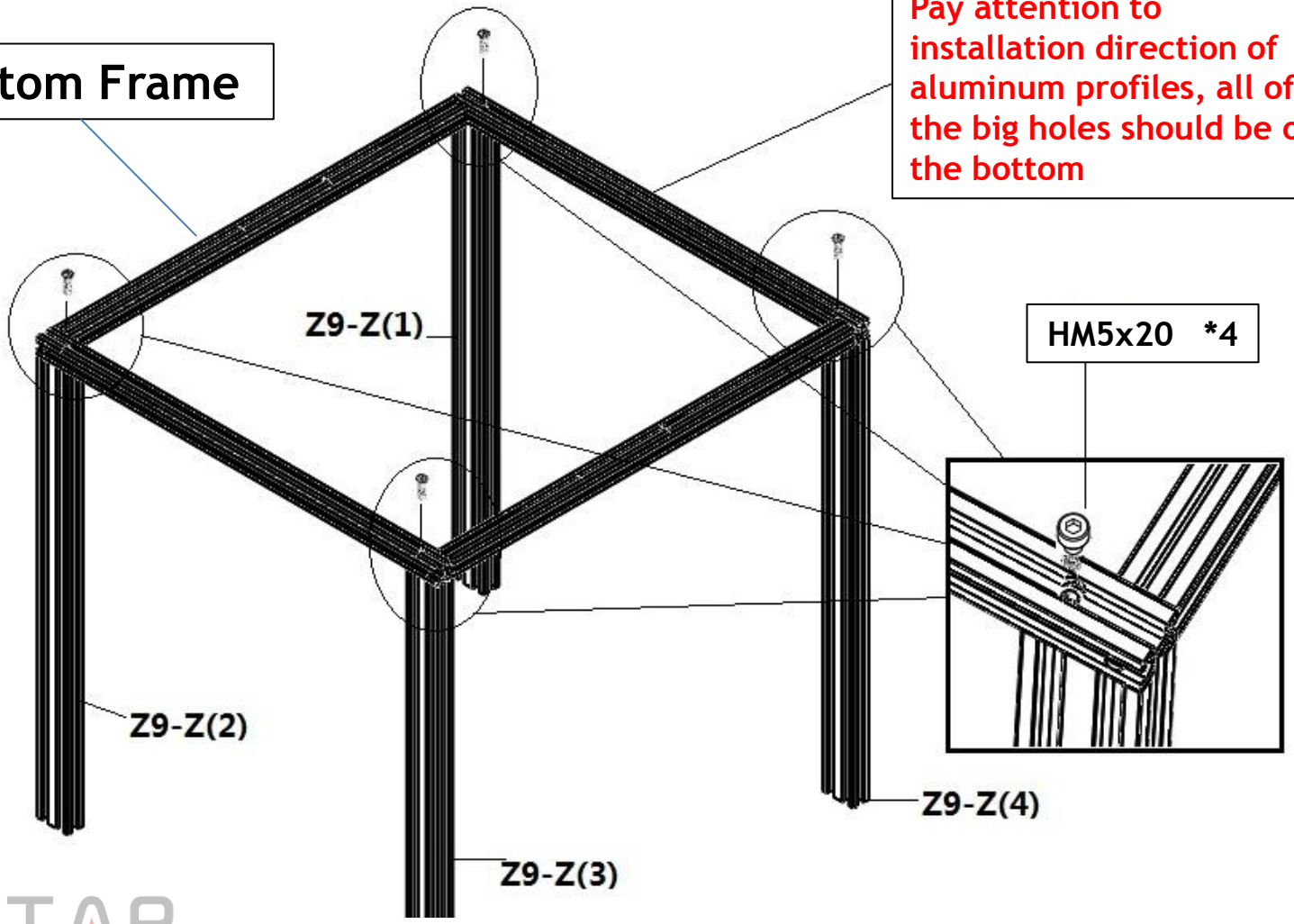


Assemble the side aluminum profiles frame



Bottom Frame

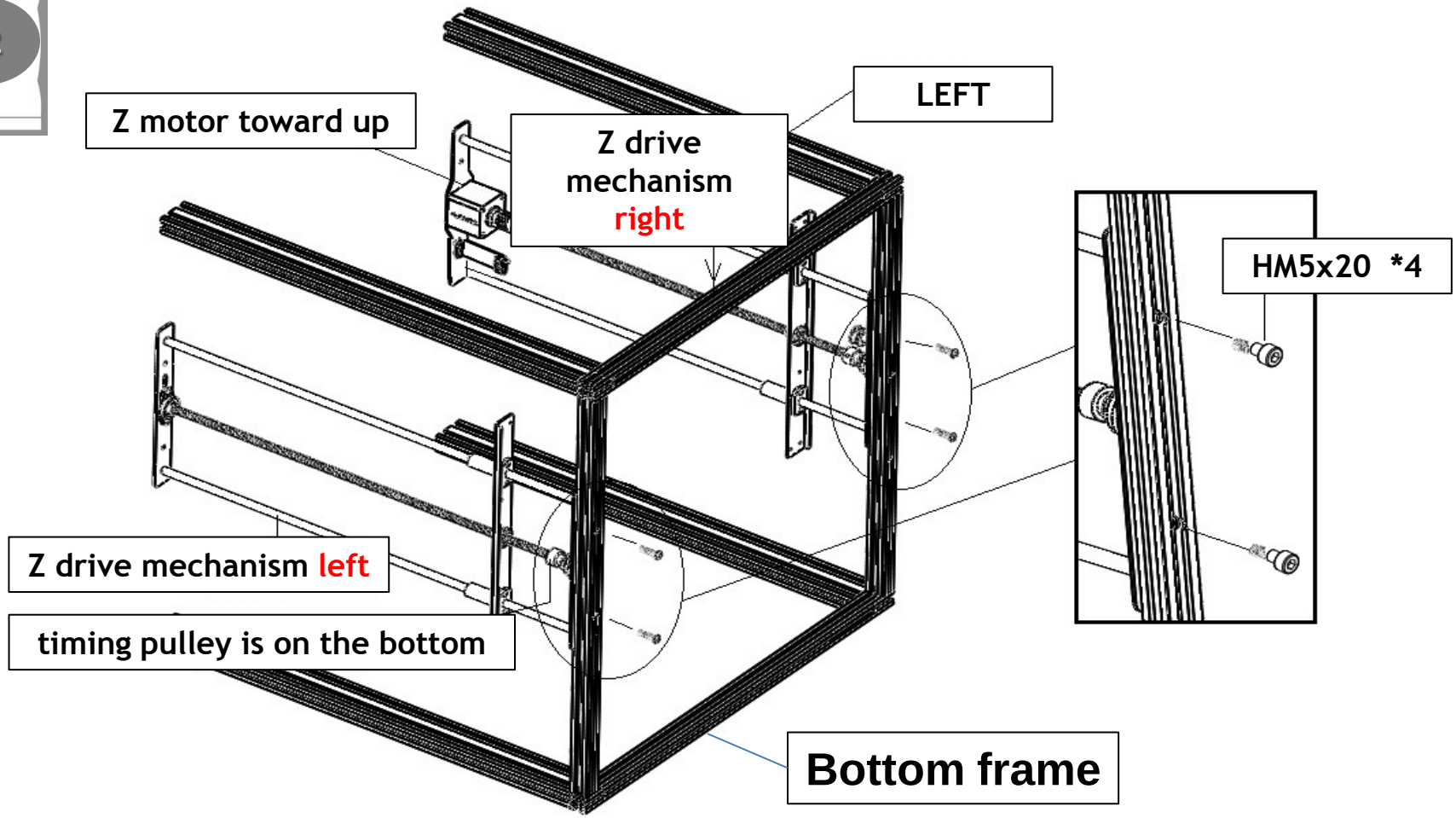
Pay attention to installation direction of aluminum profiles, all of the big holes should be on the bottom



ZONESTAR

Install Z drive mechanism to the frame

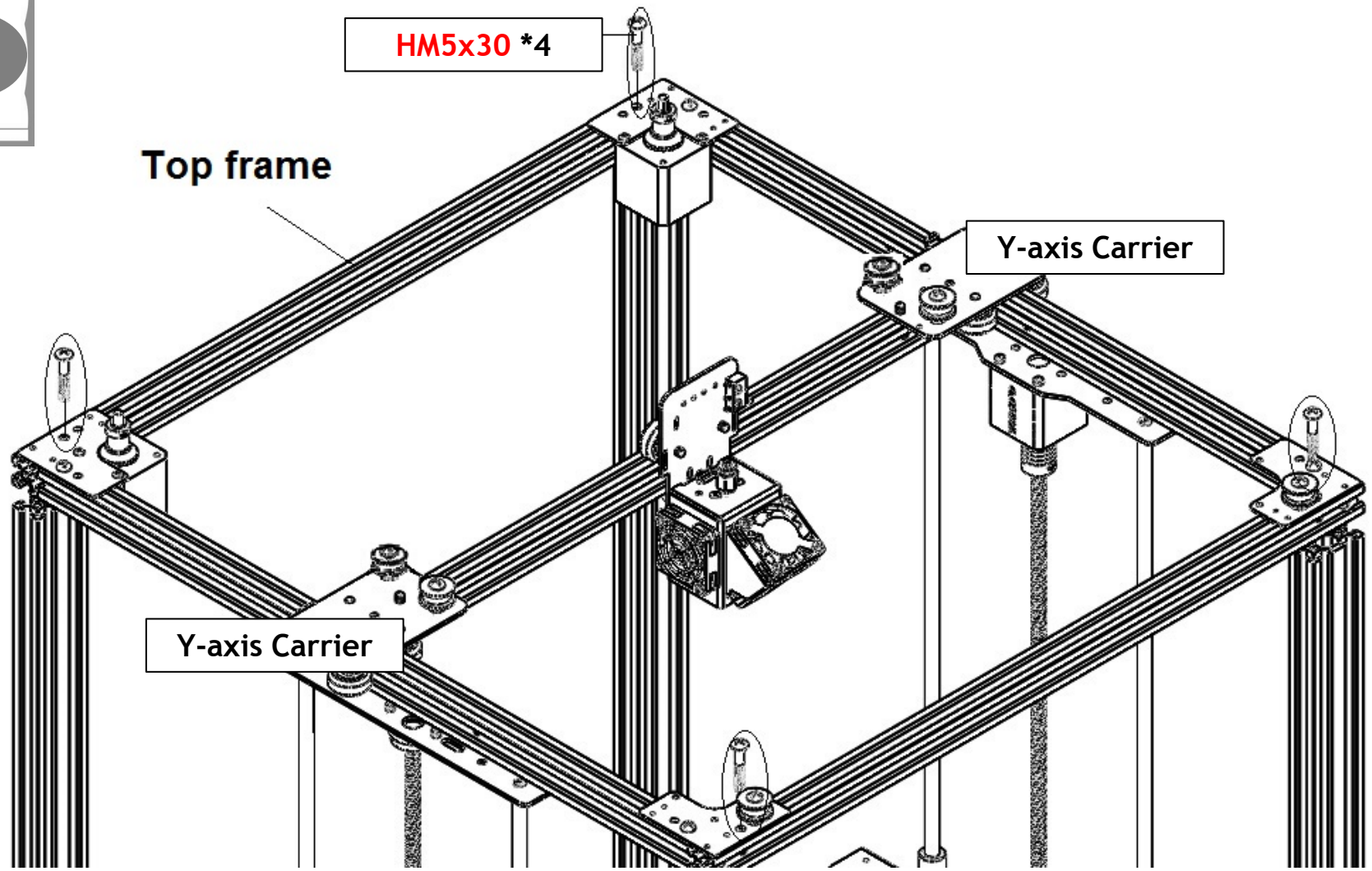
A2



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

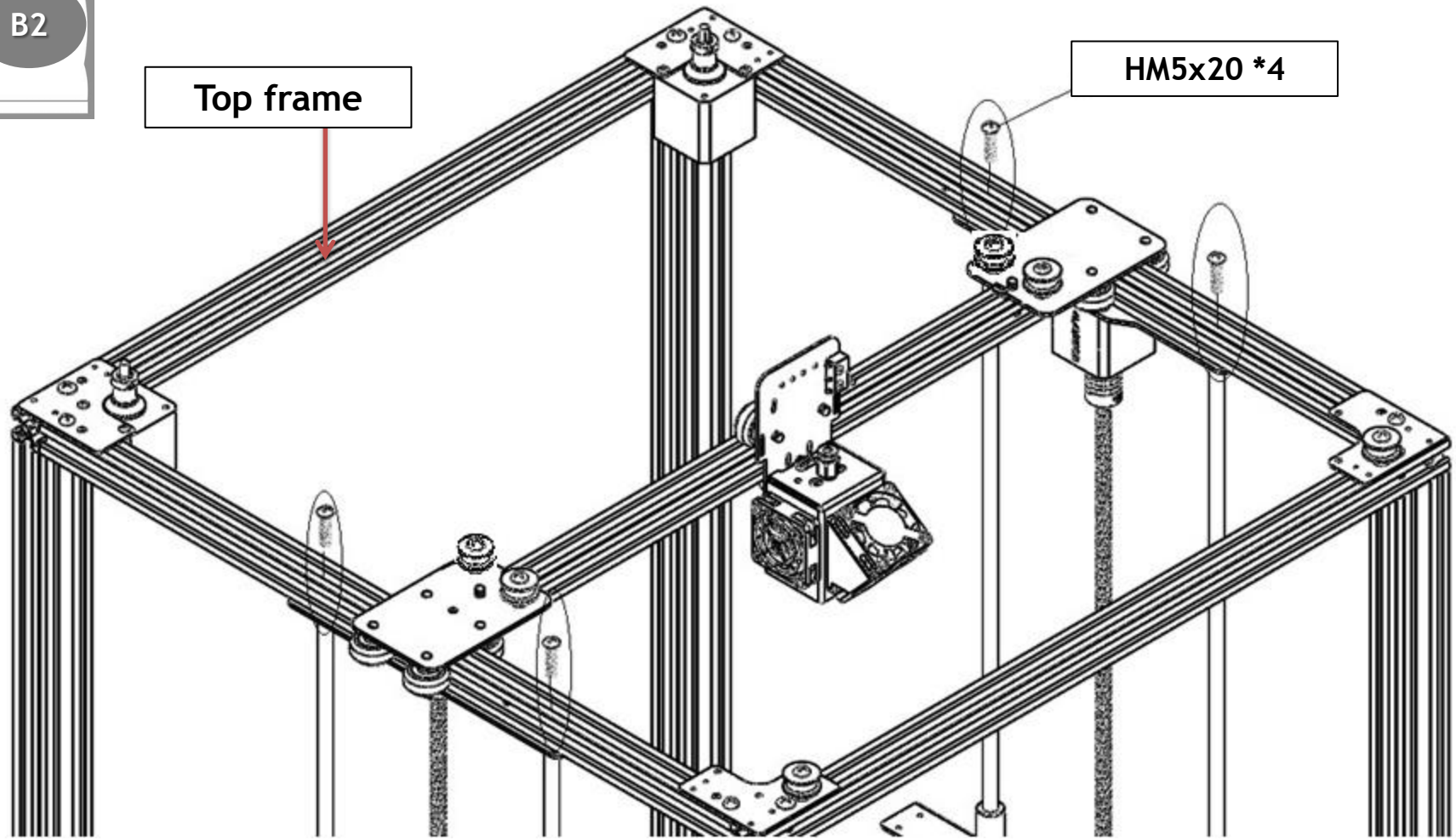
Install the top frame to Z-axis profiles - Step 1

A2



Install the top frame to Z-axis profiles - Step 2

B2



About Corexy system

1. The Z9 XY drive system uses the ***Corexy*** structure. If you want to know more about the ***Corexy***, please refer to the following links:
https://reprap.org/wiki/CoreXY
https://www.corexy.com/theory.html

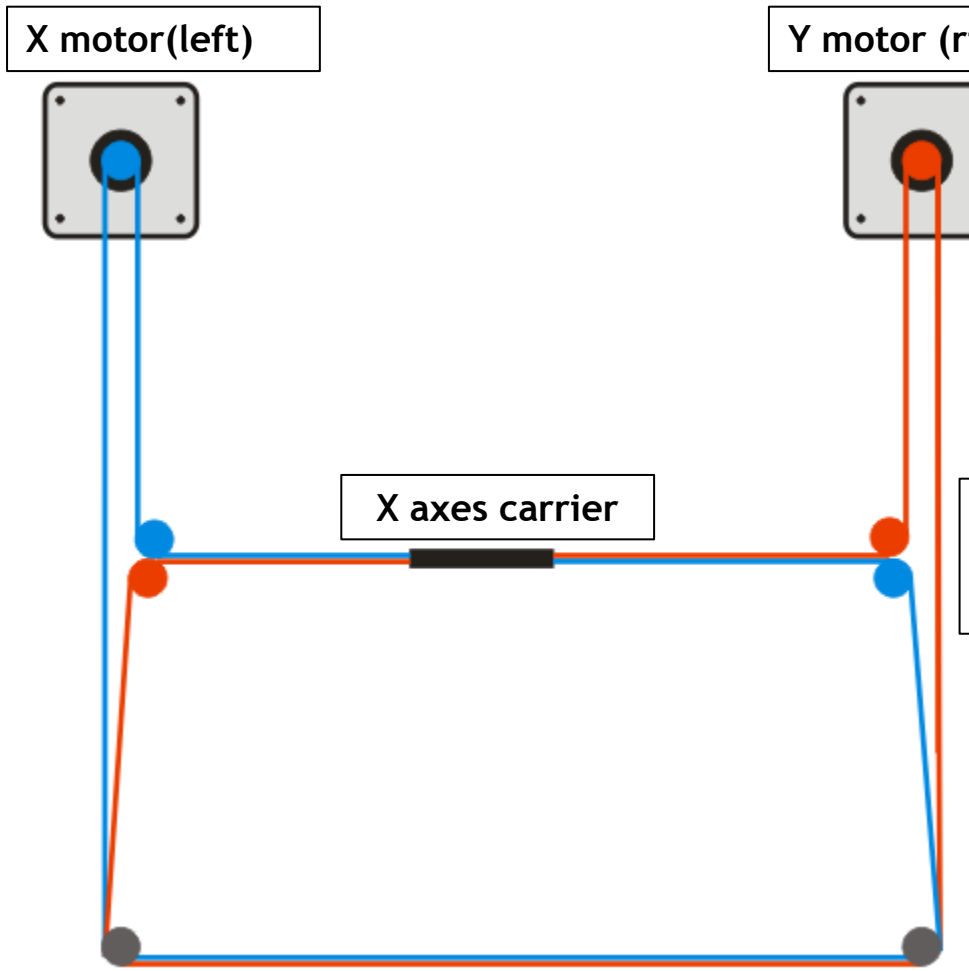
2. As a ***Corexy*** drive system, the X motor and Y motor must work at the same time when the print head move in X or(and) Y axis. For Z9, the correspondence between the moving direction of the print head and the motor rotation is as follows:

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 1: It is worth mentioning that the origin of Z9 is located at the right-back corner of the machine, it is a little different with the most of printer, but this has no effect on printing.
NOTE2: If the wiring of the X and Y motors is exchanged, or one of the X and Y motors does not work properly, the print head will not operate in the normal direction.

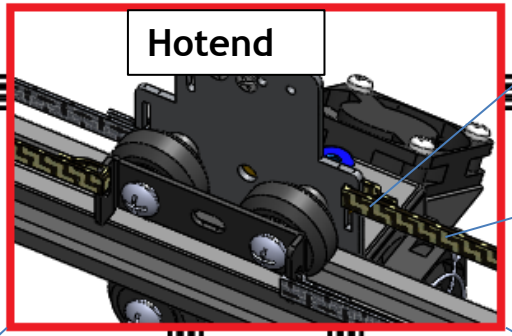
About the belts for X & Y



X motor belt (Blue) is on the bottom layer.

Y motor belt (Red) is on the top layer.

Install belts for X & Y



Hotend

Lock the belt on the bracked

X motor(left)

Y motor (right)

Cable tie

Bearing1

Bearing8

Bearing4

Bearing5

X belt is on the bottom layer

Y belt is on the top layer

Bearing2

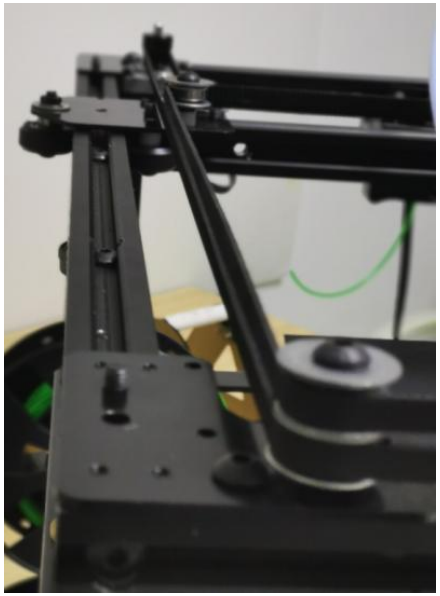
Bearing3

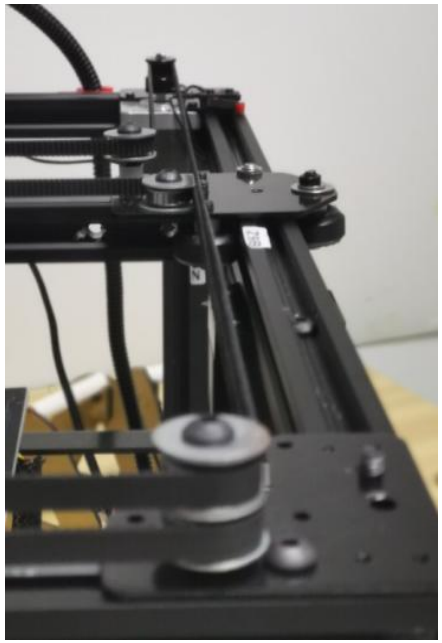
Bearing6

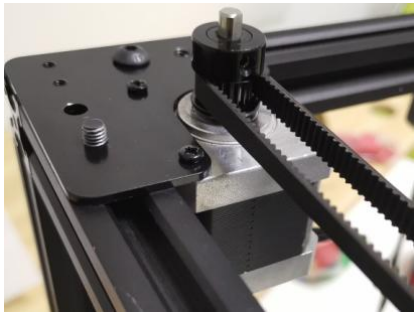
Bearing7

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. tigten the belt.
Step 3. Remove these two M5x20 screws.

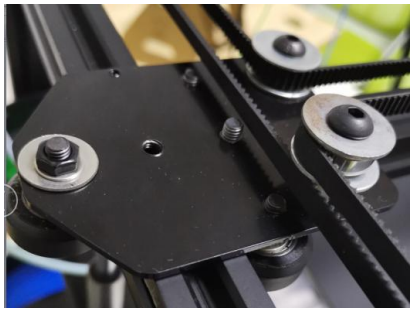
Install belts for X & Y



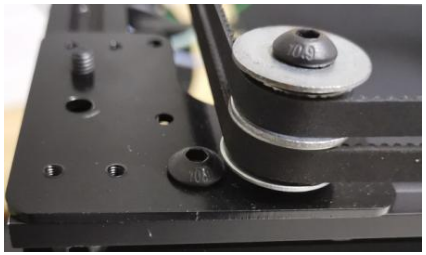




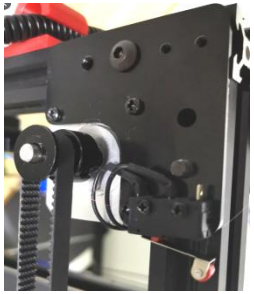
Left (X) motor



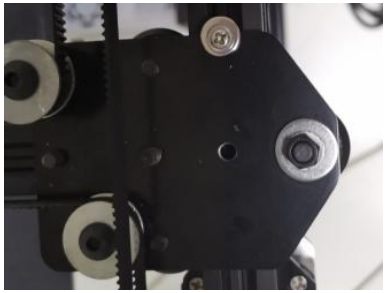
Left Carrier



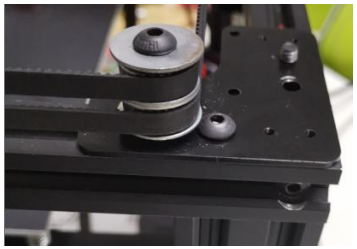
Left idler



Right (Y) Motor

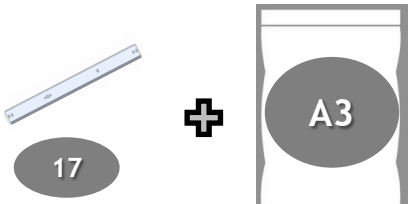


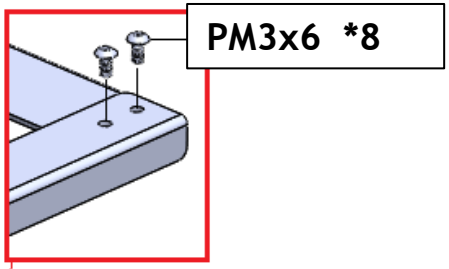
Right Carrier



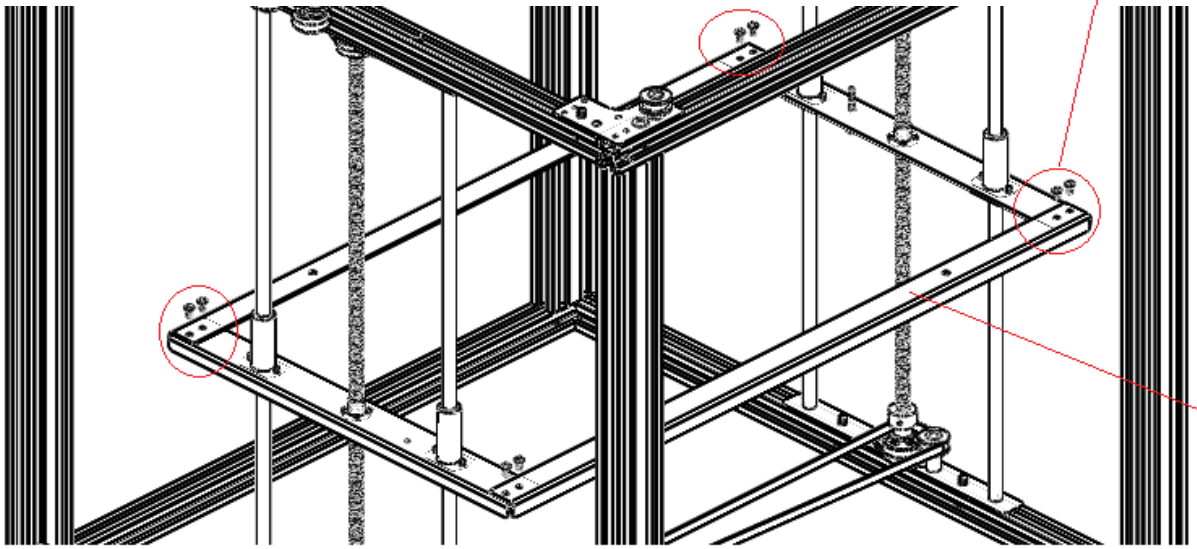
Right idler

Assemble hot bed Bracket



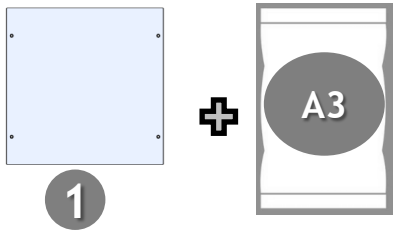


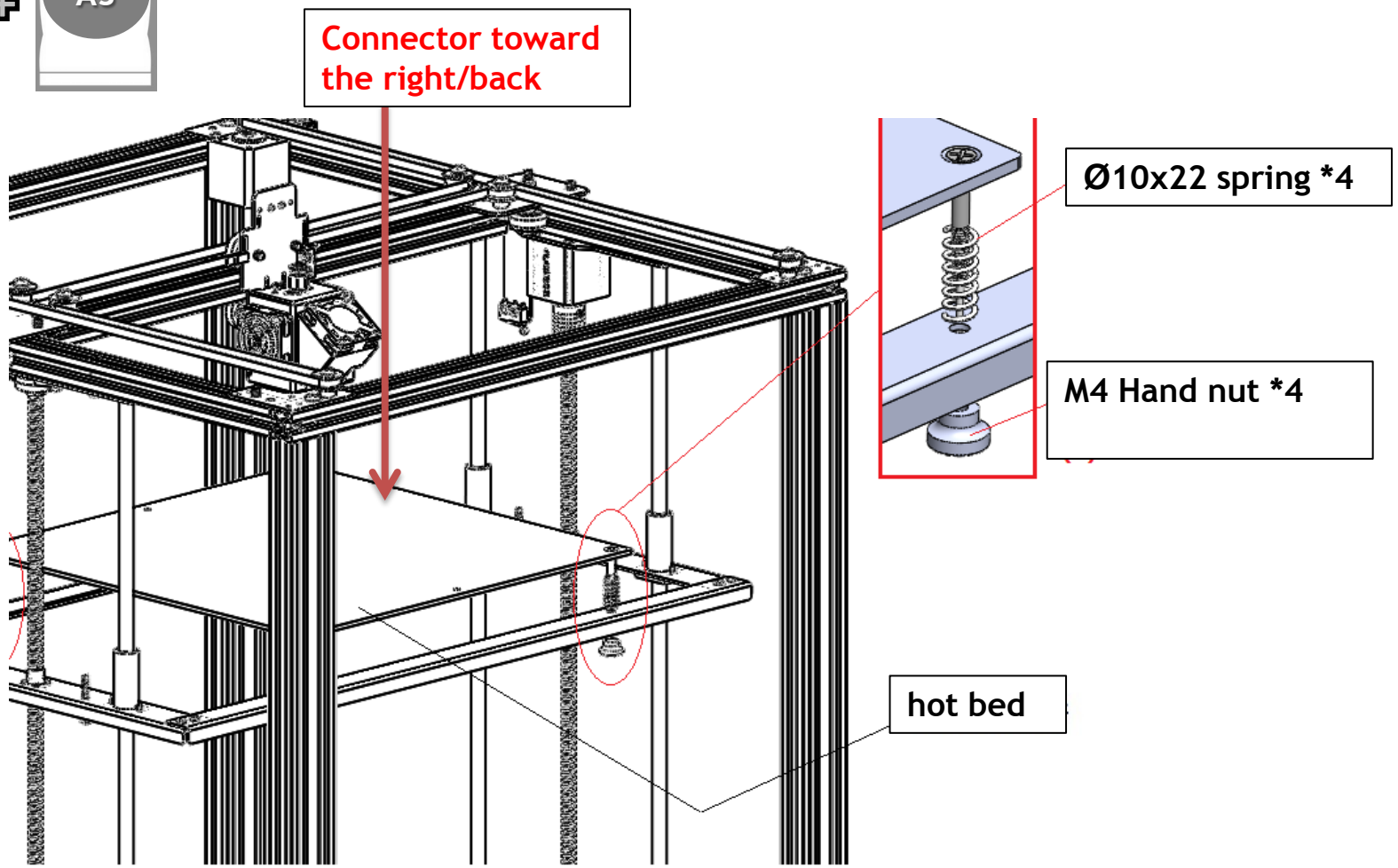
PM3x6 *8



Hotbed bracket *2
PN: Z9-2

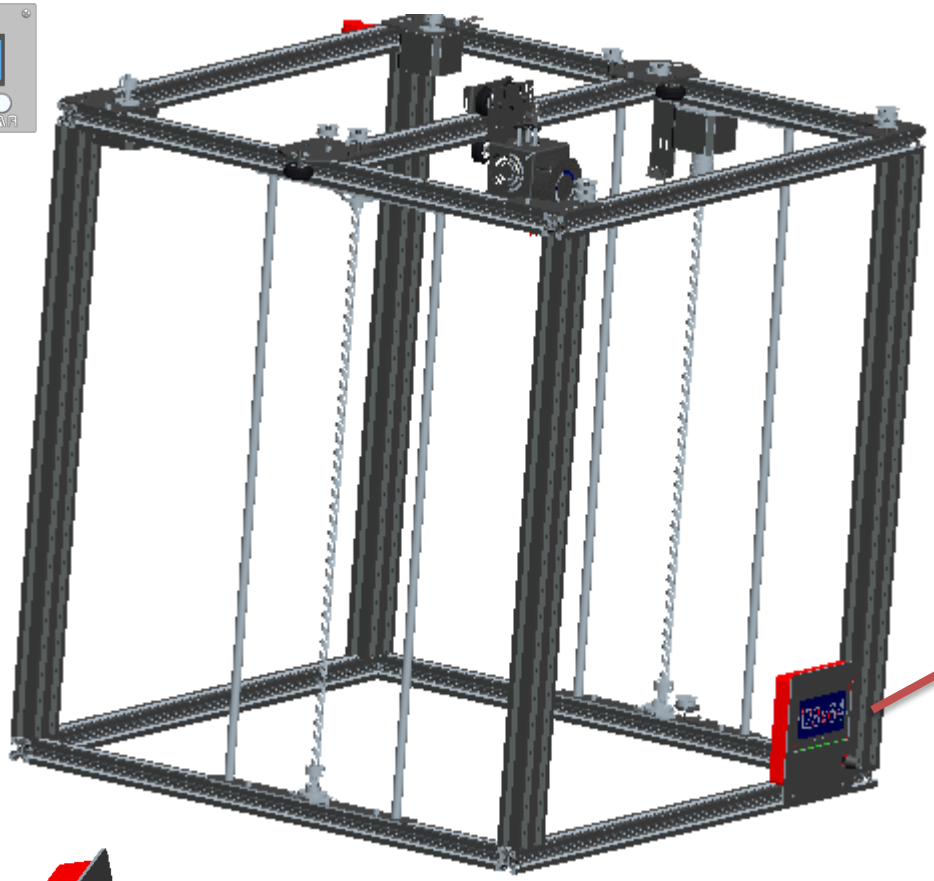
Install hot bed

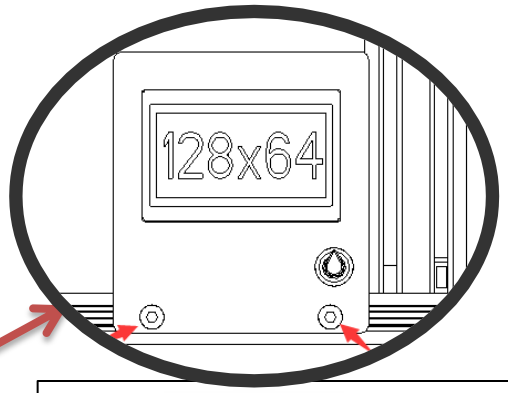




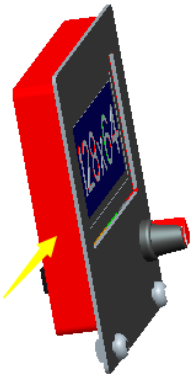
Install LCD screen

3





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

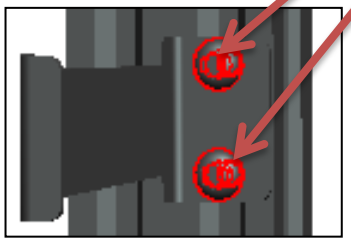


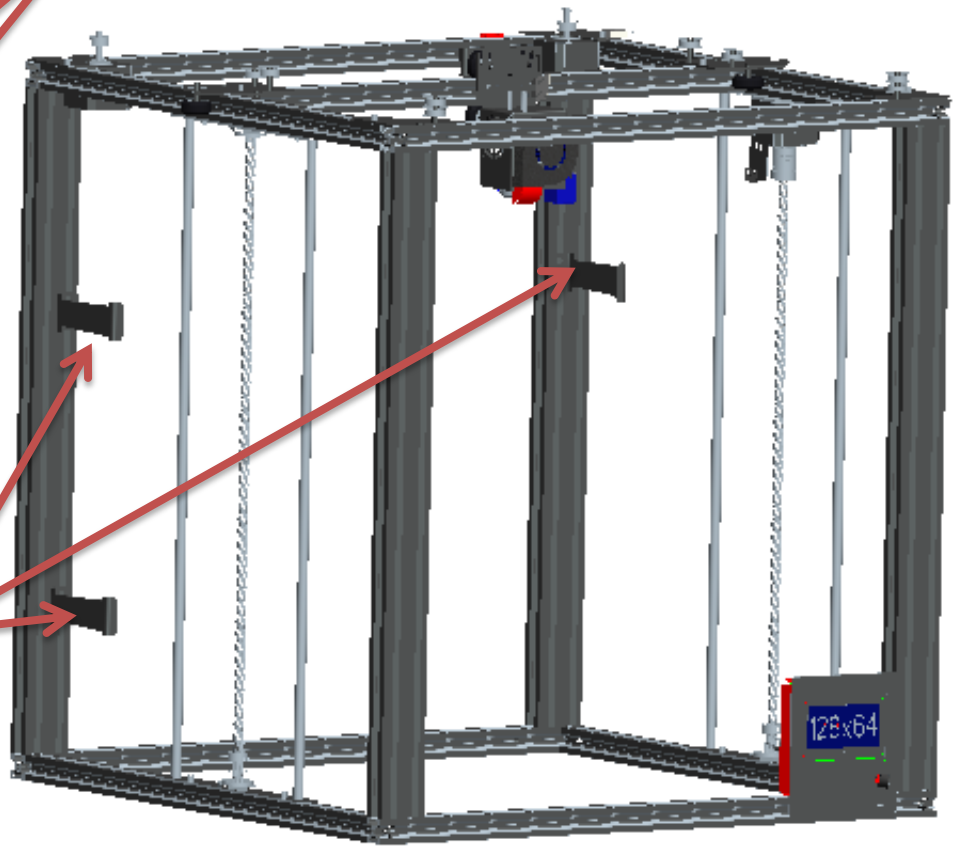
NOTE: If you want to add a cover for LCD screen, please find the "lcd12864_case.gcode" in SD card and print one, than install it to the back of the LCD screen.

Install filament roll bracket

A3

Lock these two srews install the bracket to be back Z axis profiles





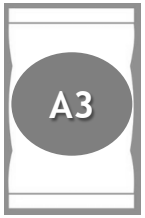
Filament roll bracket

NOTE: Install 2 sets filament roll docks for Z9M2 and 3 sets for Z9M3.

Install extrusion feeder and PTFE tube

4

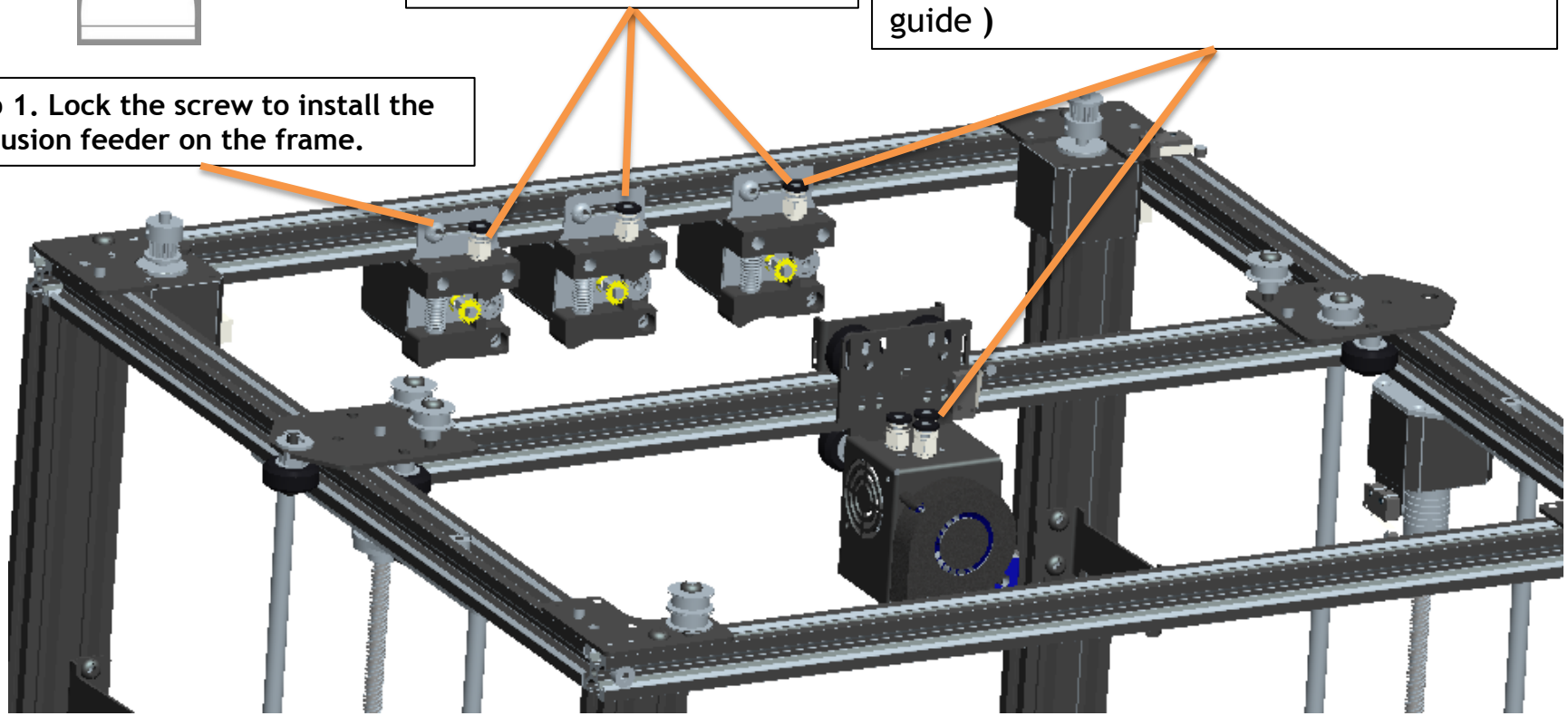
+



Step 1. Lock the screw to install the extrusion feeder on the frame.

Step 2. Install the fitting

Step 3. Insert the PTFE tube (Filament guide)

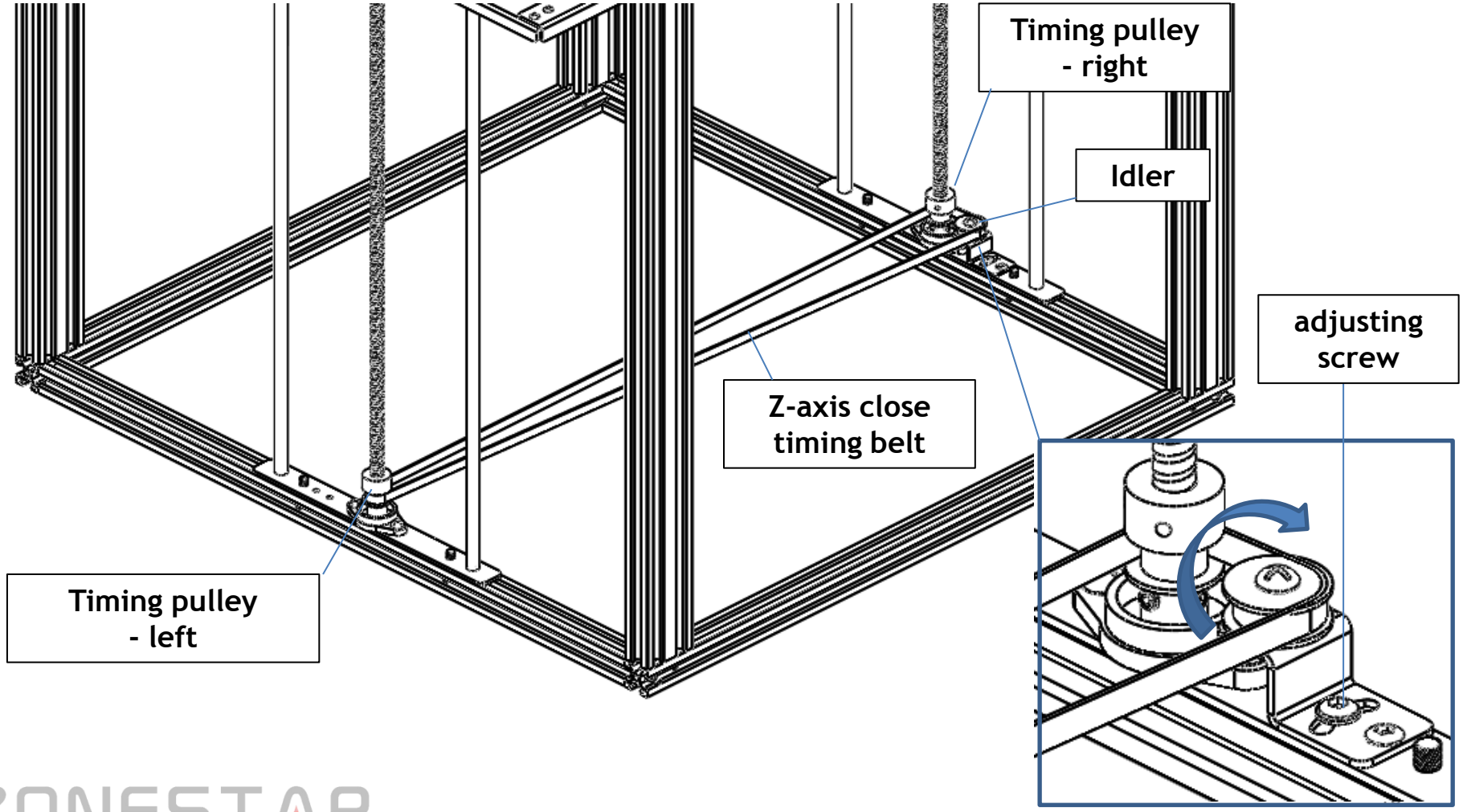


TIPS: Presss the on the fitting and insert the PTFE tube.

NOTE: We have upgrade the extruder to a new new titan extruder, the installation method is exactly the same.

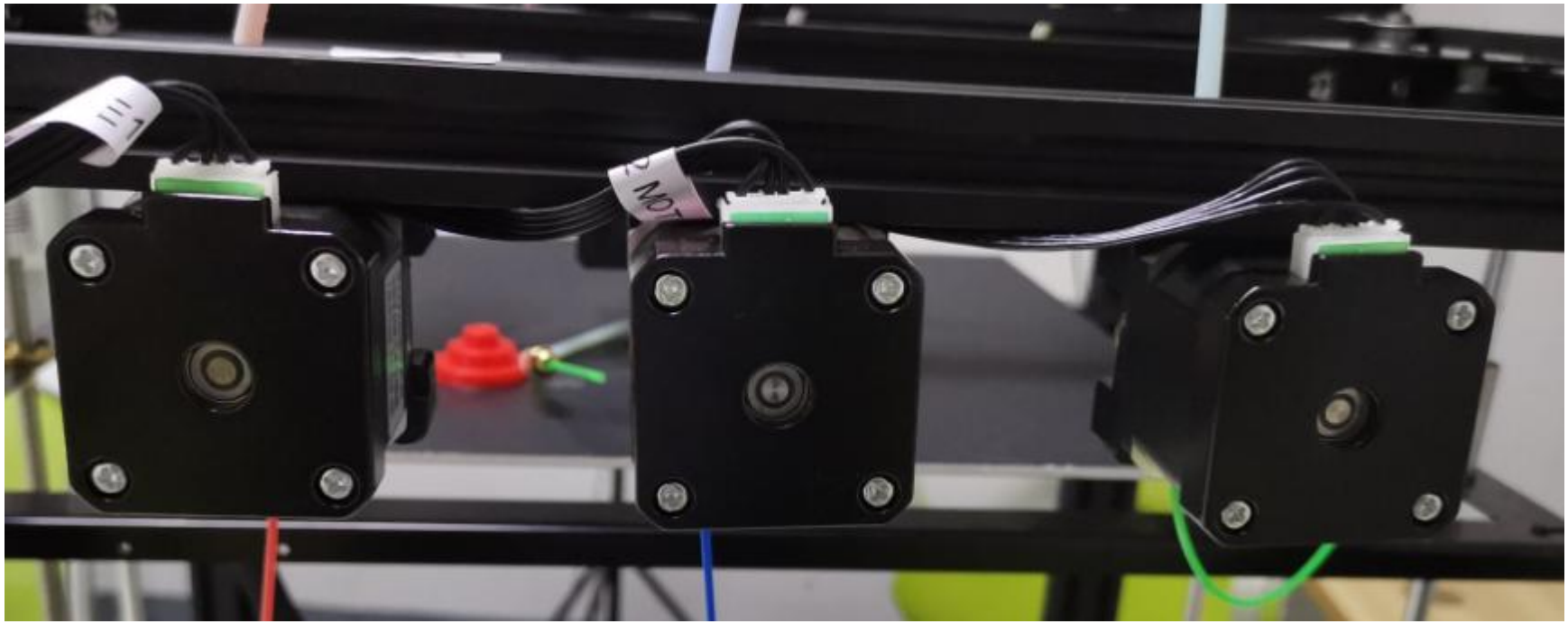
Auto the Z-axis synchronous drive system

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

Photo of extrusion feeder and Z belt idler



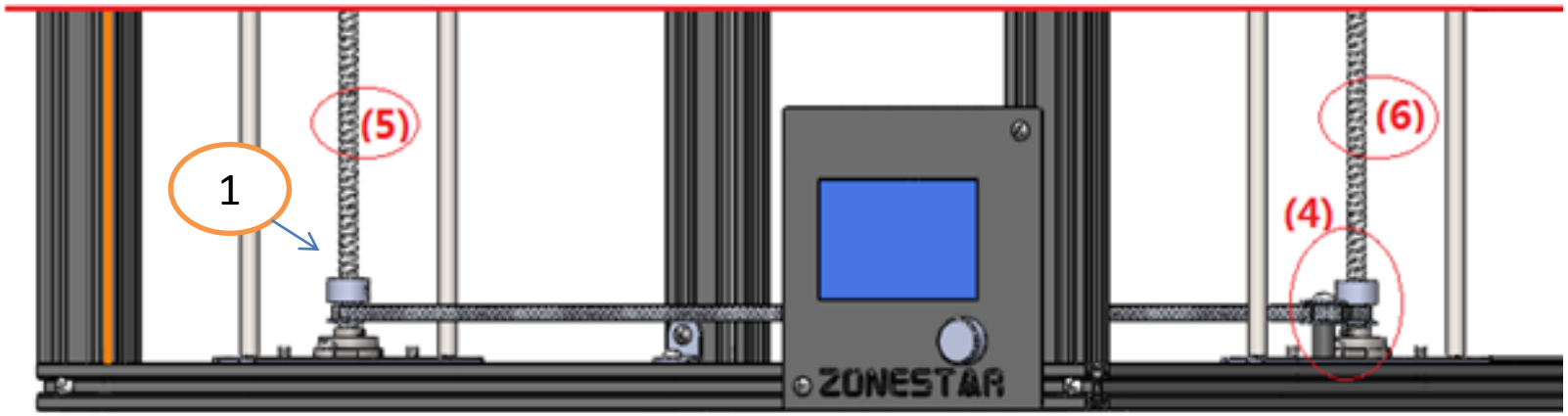
Z belt idler

ZONESTAR

Level the Z aixs - step 1

Step 1: 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.



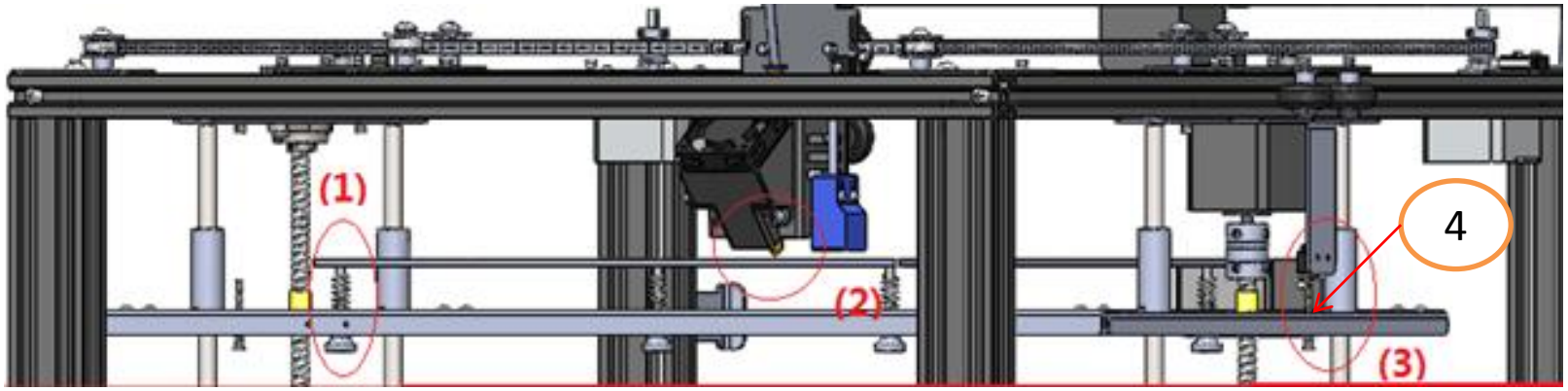
Level the Z aixs - step 2

Step 2: adjust the position of Z ENDSTOP, 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.

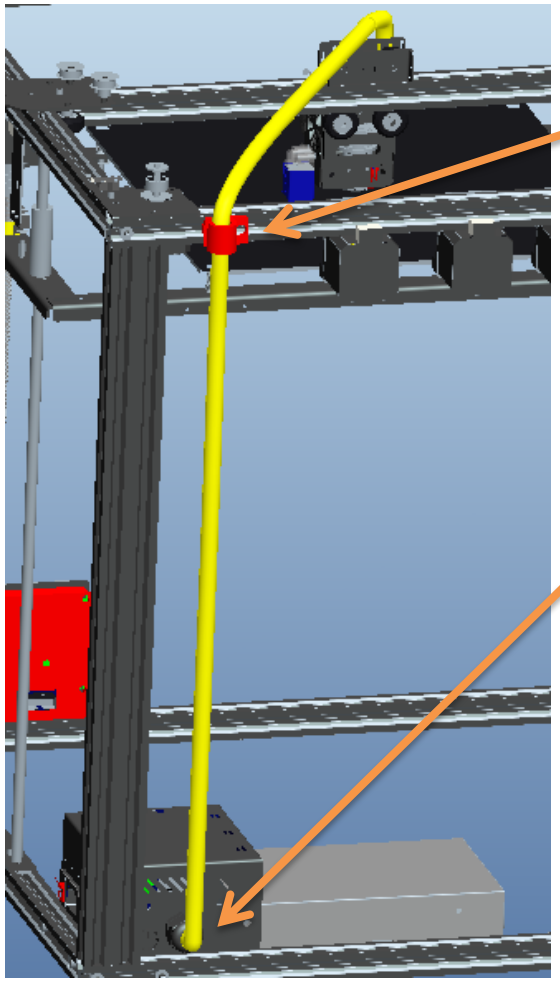
3. Adjust the height of ***Z offset adjusting screw*** (fig 4) and stops when the Z- ENDSTOP has been ***triggered,*** lock the screw by nylon pole after finish.

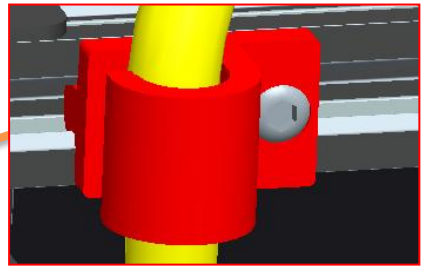


Wires layout

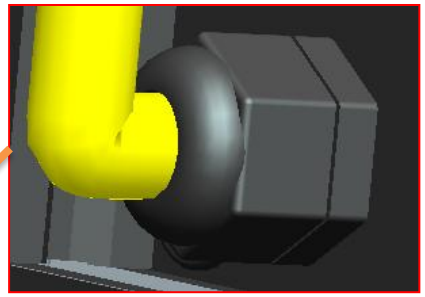
24

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





Install hotend wire clip to hold the corrugated pipe



Install a Bellow Seal Joint to the control box

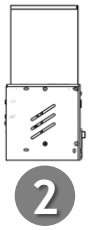
Y Motor Cable
Y ENDSTOP cable
Z Motor Cable
Z ENDSTOP cable

HOTEND cable fitting

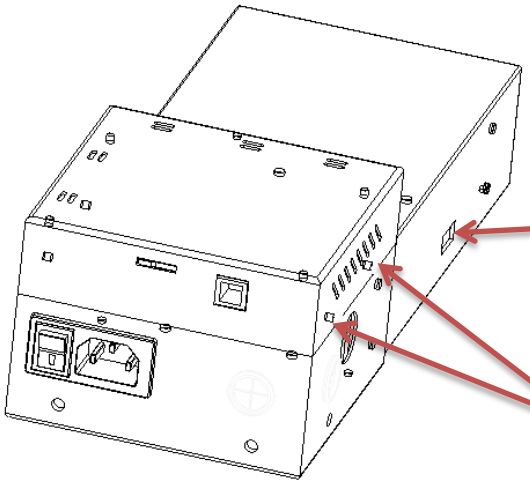
X Motor Cable
Extrusion feeder cables

ZONESTAR

Install control box



Step 1: Open the control box and wiring the hotend wires to control board.
Step 2: If your city power is 110V, set the power select swicth to 110V.
Step 3: Install the control box to the bottom/back/right corner of the frame.



AC power voltage select switch

Loosen these four screws (on both of sides) to open the control box

Micro SD card

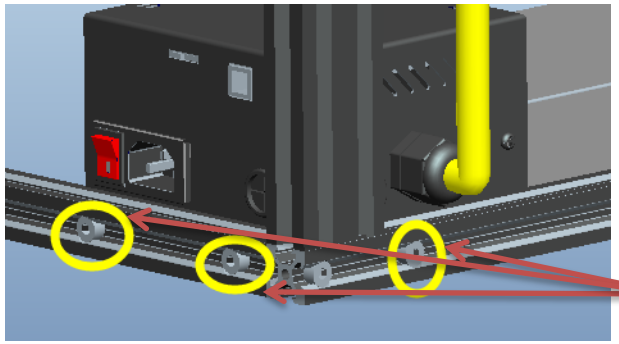
USB cable

AC Power cord

Y Motor Cable
Y ENDSTOP cable
Z Motor Cable
Z ENDSTOP cable

X Motor Cable
Extrusion feeder cables

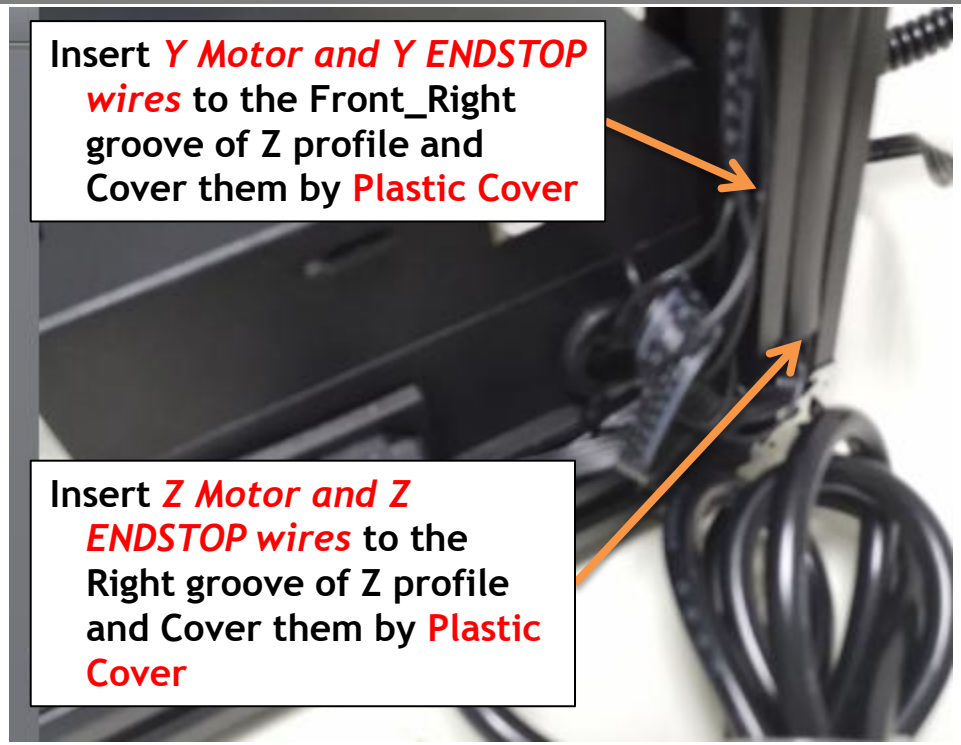
HOTEND cable fitting



M5x20 *3

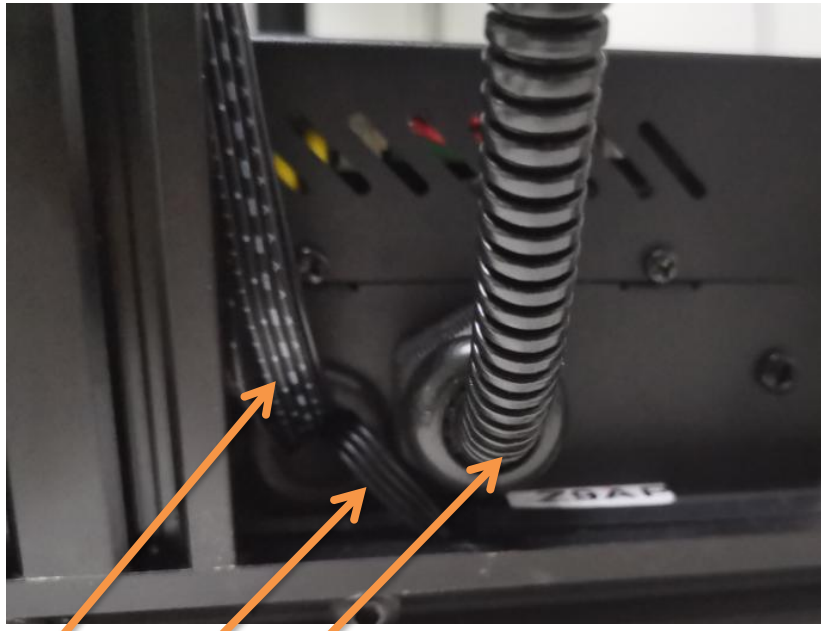
ZONESTAR

Wires layout



Insert *Y Motor and Y ENDSTOP wires* to the Front_Right groove of Z profile and Cover them by Plastic Cover

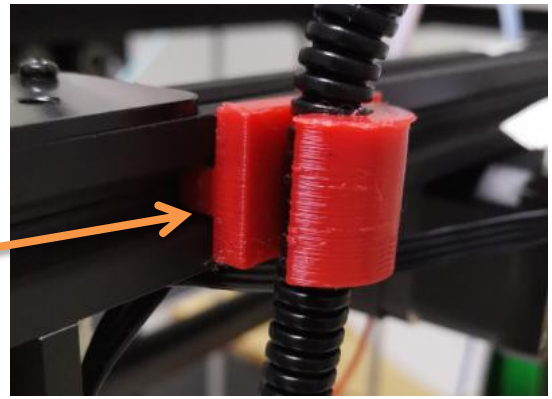
Insert *Z Motor and Z ENDSTOP wires* to the Right groove of Z profile and Cover them by Plastic Cover



Insert *Extrusion Motors' wires* to the Left groove of Z profile and Cover them by Plastic Cover

Insert *X Motors' wires* to the Left groove of Z profile and Cover them by Plastic Cover

Printer head wires



ZONESTAR

!Attention!

Take care when installation, to avoid electrical shock hazards!

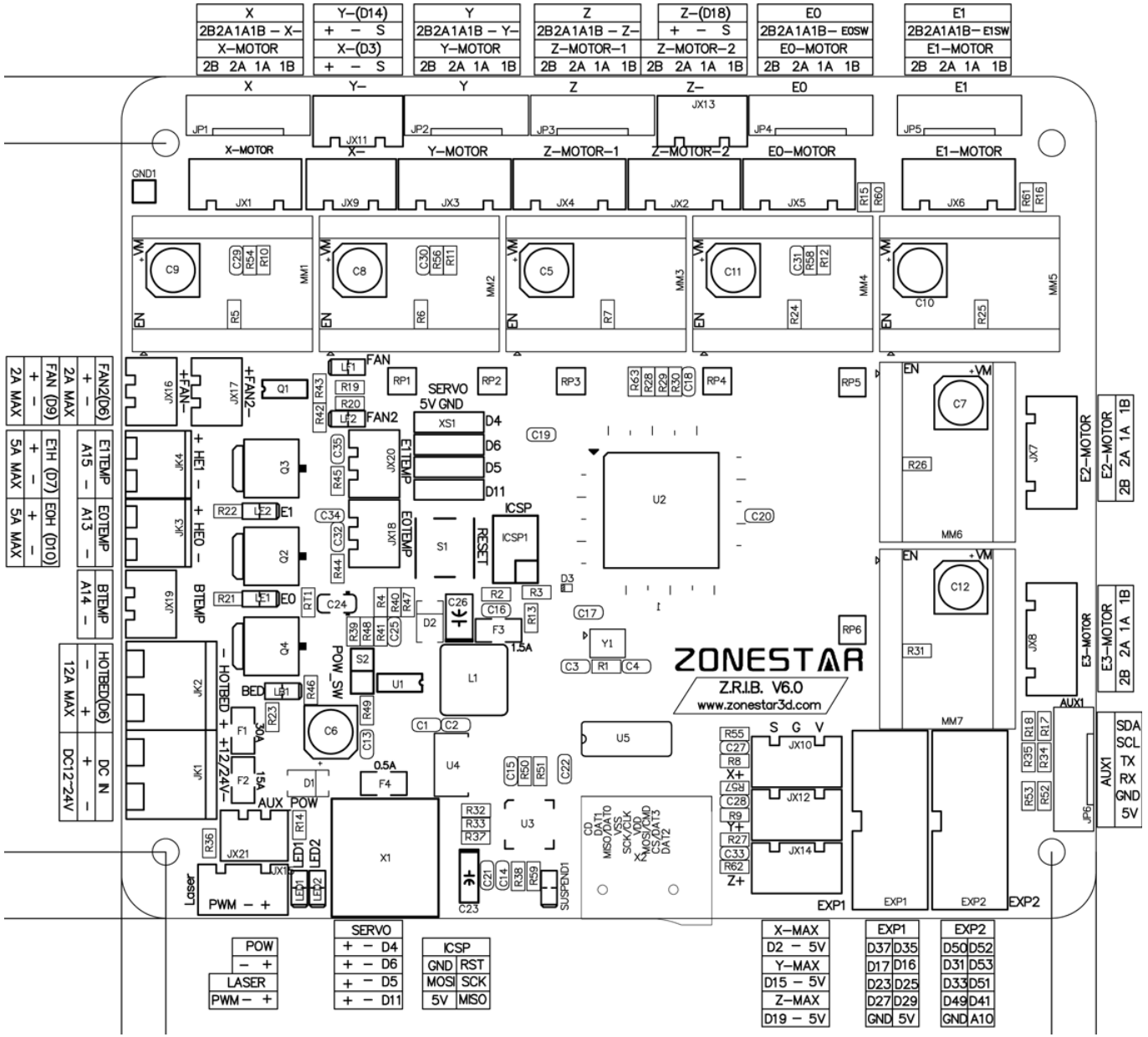
Once the connection is completed, please confirm again.
WRONG WIRING MAY DAMAGED THE ELECTRONIC DEVICE!

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

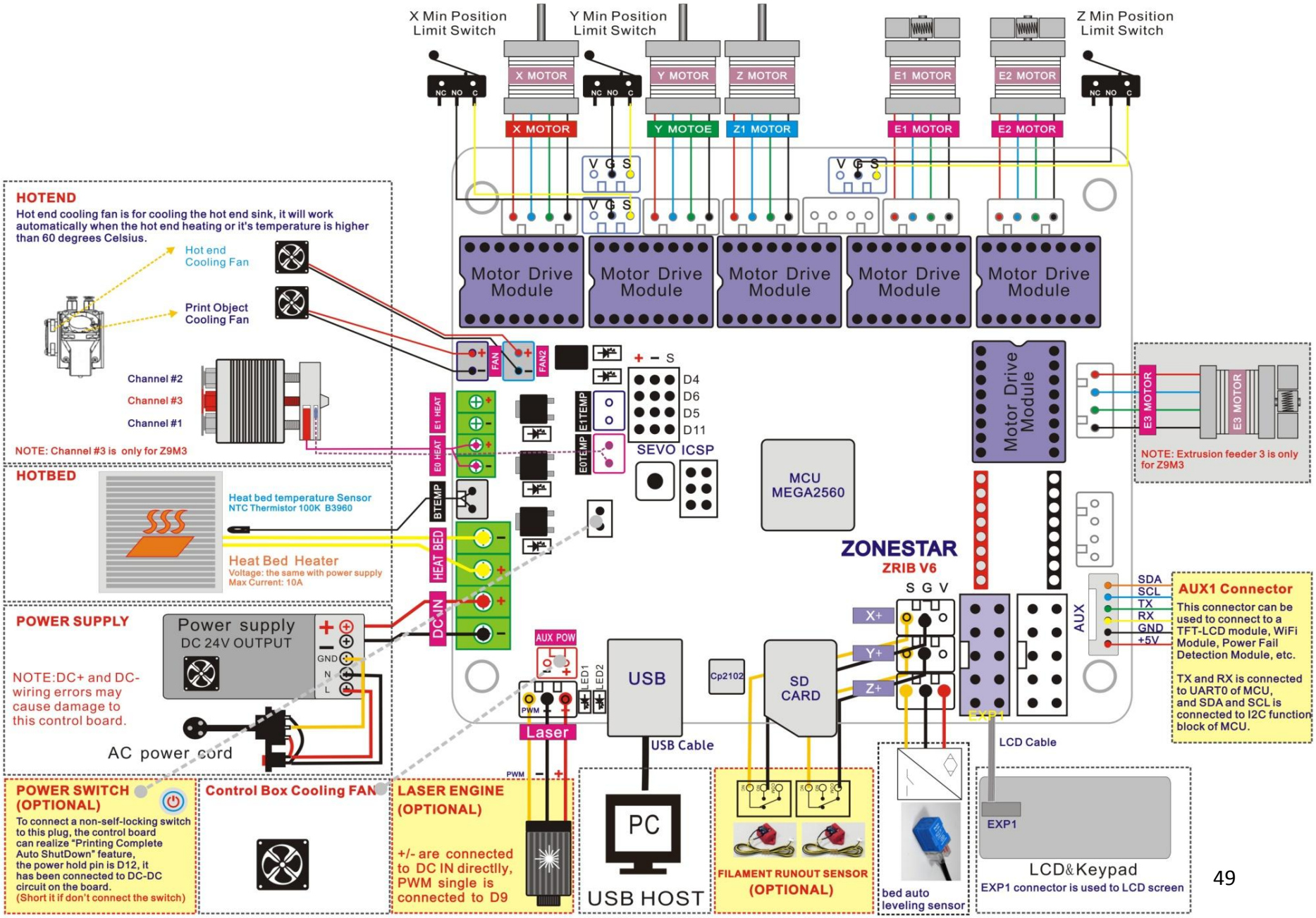
Please use cable tie to wrap the wires when wiring is completed..

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

Pin out of ZRIBV6



Wiring Diagram



About motor driver module

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

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:

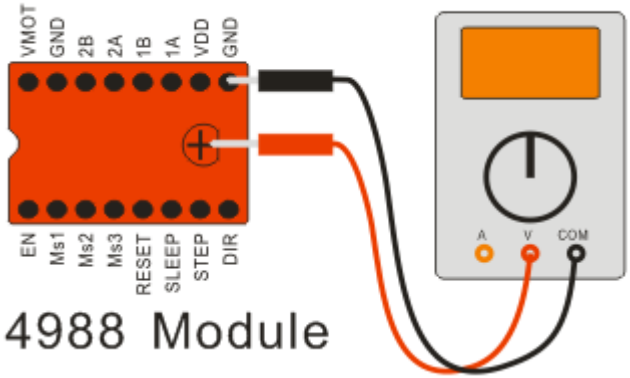
X Y& Z motor: 0.8A

Extruder motor: 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 (as below picture).

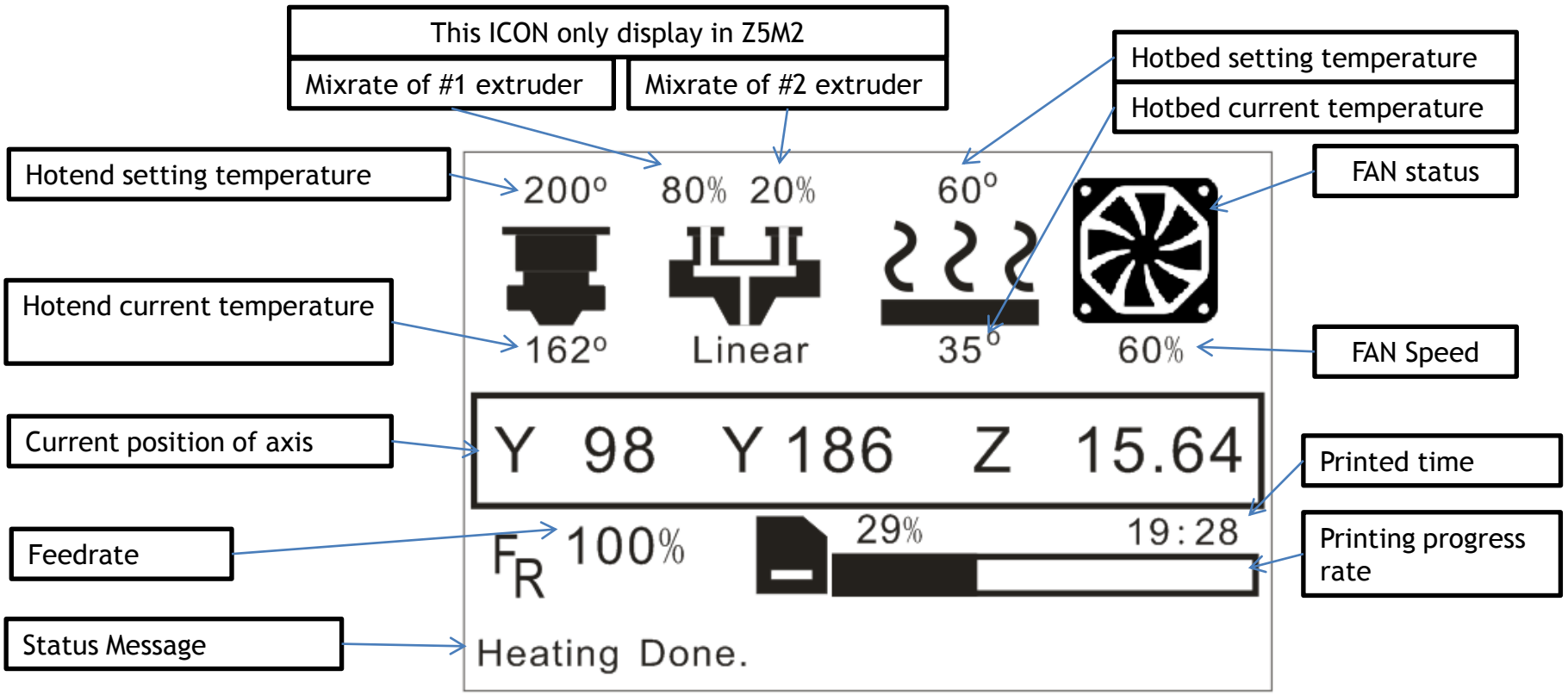
For 4988 driver module:

I motor = Vref * 1 . 25



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

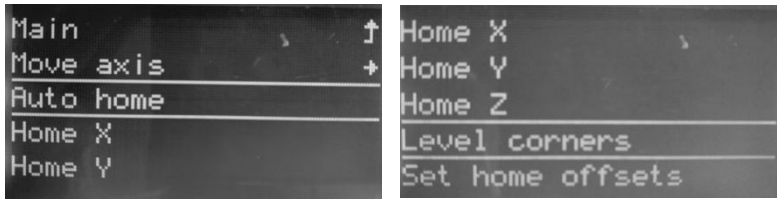
1. Clean nozzle: make sure there aren't any filament at the end of nozzle, if not, remove it by a diagonal pliers.

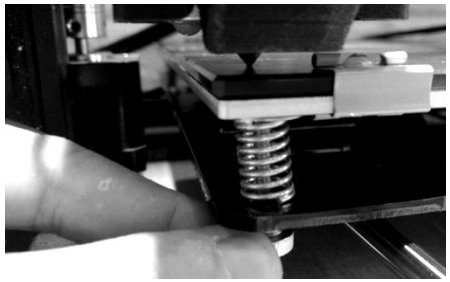
2. Choose “Prepare”>> “Auto Home”>>, wait the hotend go to the orig position.

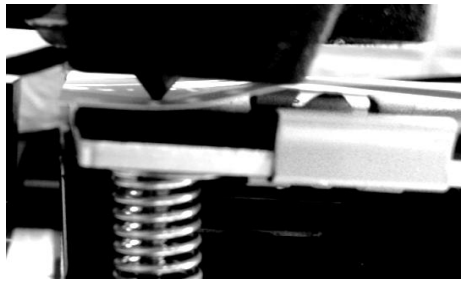
3. Watch the nozzle and make sure the nozzle is higher than the bed, otherwise tighten the hand nuts under the bed to pull down the hotbed or loosen these nuts to move up the bed.

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

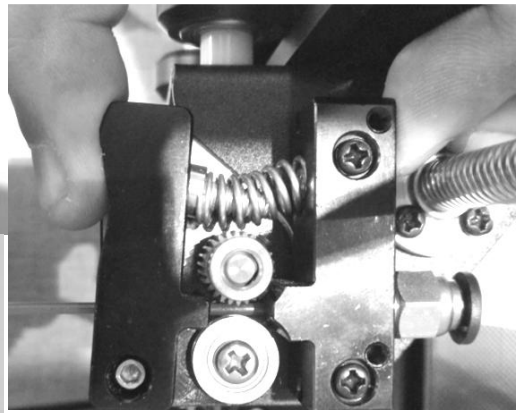
1 Preheat nozzle: Choose “Prepare”>> “Preheat PLA”, then nozzle and hotbed will be heated. **Waiting nozzle temperature reached to setting.**

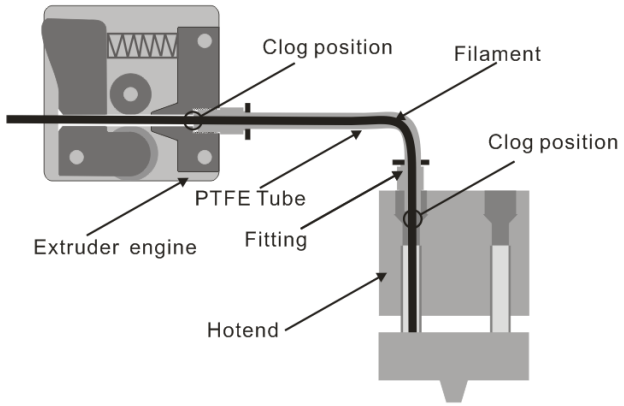
2 ***If there is filament in the hotend, do this step, otherwise skip this step.***
Choose “Prepare”>> “Move axis”>>”Extruder”>>”Move 1mm”>>”extruder: ****mm”, then Clockwise rotate the knob slowly, until you can see the filament flow from the nozzle.

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.

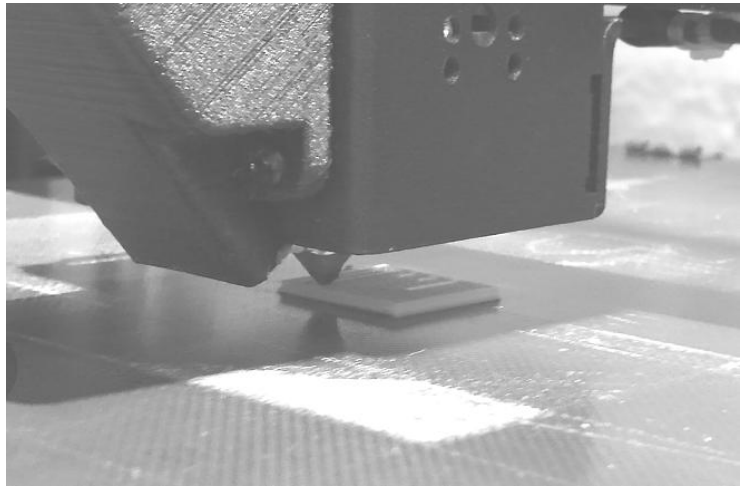
Print a test 3D object (Print from SD card)

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.



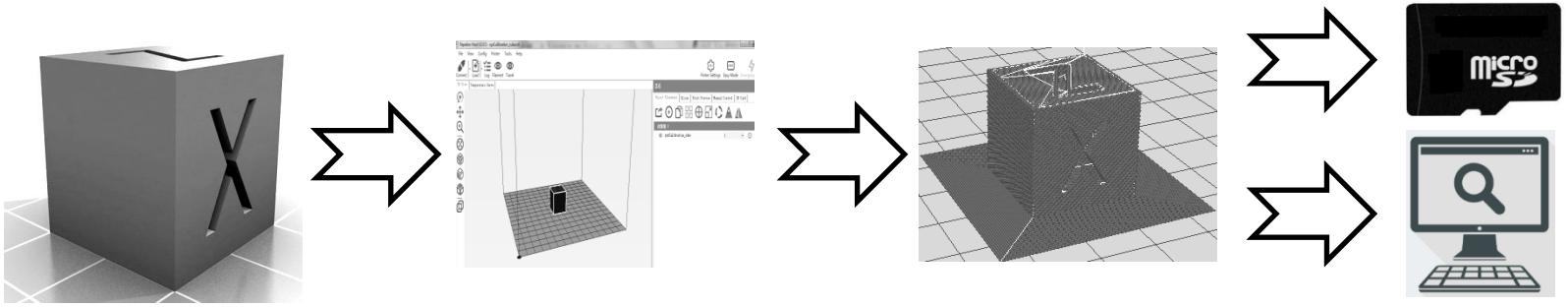
Insert SD card to control box and then start to print

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: **"PC Software & Driver\slicing & Host software"**.* You can also download the latest document from our cloud disk:
https://drive.google.com/drive/folders/0B9Z1DbrxfqbpUjNHRXhBWmlVZVU
If you want to control the printer from PC HOST, we store the guide in SD card, please find it out and read it.

How to apply the mixing color feature

1

Manually extrude mixing color filament *(extruding from both of extruders at the same time):*
Step 1*: Refer to the "Prepare to print - Load Filament" to load filament to both of extruder engine, and make sure the filament has been insert to hotend already.*
Step 2*: When nozzle temperature reached to the settings, choose "Prepare">>"Move axis" >> "Control">>"Set Mix rate">> "E1/E2/E3 percent" change this value, this value means extrusion percent of extruder 1/2/3., then do* **"Normalize and Apply"** *to apply it.*
Step 3*: Choose* ***Prepare>>Move Axis>> Extruder>>Move 10 mm****>>Add this value, watch the extruder engine, you will both of the filament will enter to the hotend, and after extrude about 50mm, the filament will flow from the nozzle and color will be different according to the mixed ratio of the setting.*
** At the beginning, the color of filament maybe comes from the remaining in the nozzle.*

2

Manul mixing *(Mixing two color filament when printing from SD card):*
Step 1*: Start to print a monochrome object from SD card.*
Step 2*: After the printing start, choose "tune">>"E1 percent" >> change this value. The printer will* ***automatically mix*** *the 2nd extruder's filament according to the setting.*
PS: Mixing result is affected by many factors such as object shape, path planning, filament type and so on.

3

Auto mixing *(Converter a monochromatic object to a multi-color object):*
Using this function, you can convert a monochrome object into a mixing-color object.
Step 1*: Start to print a monochrome object from SD card.*
Step 2*: After the printing start, choose "tune">>"Auto Mix Mode" >> change this value to 1 or 2. If choosing "1", the printer will* ***automatically mix*** *the 2nd extruder's filament,* ***from less to more****, according to the printing progress. If choosing "2", the printer will* ***randomly mix*** *the 2nd extruder's filament to hotend in the printing process.*
PS: Mixing result is affected by many factors such as object shape, path planning, filament type and so on.

4

*You can also set the printer to print two colors, mixing colors and use up to 16 virtual extruders when slicing. For more about mixing color feature, please refer to the document in the SD card, directory: "****Operation\ Mix Color HOTEND User Guide"****.* ***Y****ou can also download the latest document from our cloud disk.*

Upgrade more feature

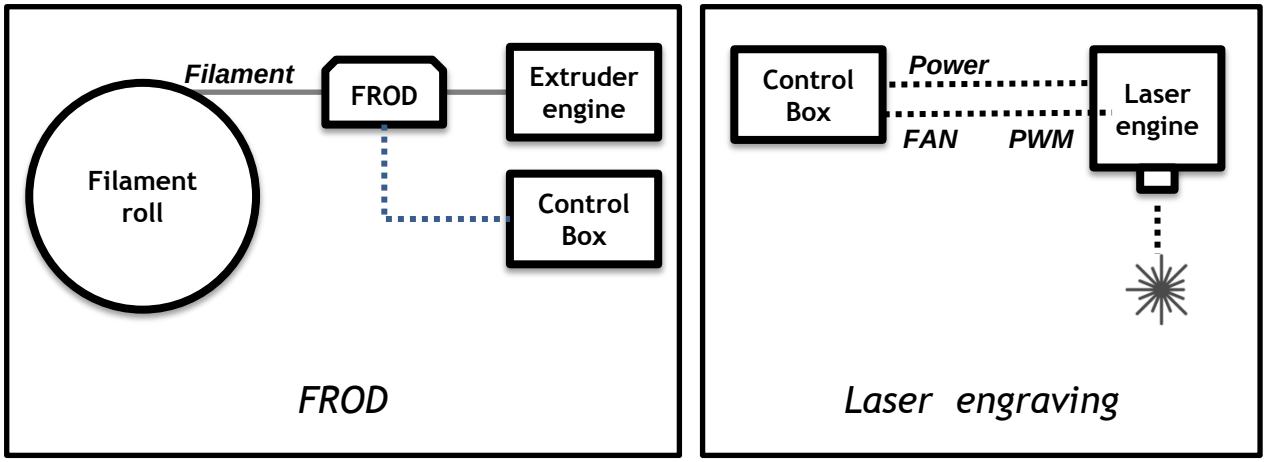
1 **FROD:**

Filament run out detector is a sensor be used to detect the filament roll use up, Z5 control box can connect one FROD. About how to connect this sensor, please refer to the wiring diagam.

2 **Laser engraving:**

Only need to install a laser engine on the print head, you can turn this machine into a simple laser engraving machine.

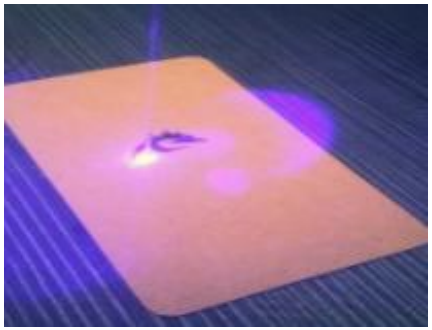
If you are interesting in these features, welcome to vist our ***online store*** *to purhcase.*



Improve: Upgrade a laser engraving kit

Click to Know More

Scan to purchase!



About ZONESTAR

ZONESTAR Innovation Technology Co., Ltd. is a high-tech manufacturer specializing in the development and production of 3D printers.

Since began to develop and manufacture 3D printers in 2013, we have successively introduced several series of products such as P802, D805, Z5, Z6, Z8, Z9, and Z10, which are popular with customers all over the world. Now, ZONESTAR has Gradually grew to be a leader in the category of DIY 3D printers.

At the same time, we are committed to applying 3D printing technology to a wider range of fields and have successfully developed 3D printers for use in food, advertising, ceramics, and other fields.

ZONESTAR has always regarded ***Innovation***, ***Quality*** and ***Service*** as our core value of the company and strived to provide customers with high-quality and high-tech products and excellent services.

www.zonestar3d.com