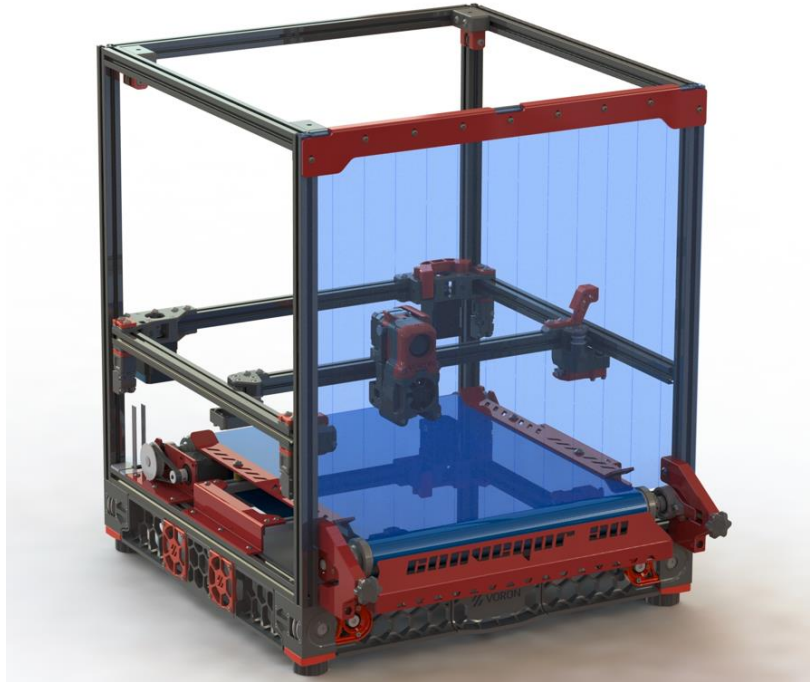


# VORON BELT 350 KIT

## ASSEMBLY MANUAL



STEP BY STEP INSTRUCTION MANUAL

*BY ADITIVA 3D*

*V1.0*



ADITIVA3D



**BELT 3D PRINTER  
KIT**



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## Chapter 1 Intro

### Step 1.1 What is included in this kit?

In this kit you will find all the necessary parts for converting your regular Voron 2.4 3d printer into a sequential Conveyor 3d printer. Parts lists are indicated on each step for better understanding and guidance.

### Step 1.2 Needed tools

In order to fully install this kit, you will need the next tools:

- ✓ Set of Allen keys
- ✓ Adjustable wrench or wrench kit
- ✓ Measuring tape
- ✓ Vernier caliper
- ✓ Metal ruler (for alignment)

## Chapter 2 Disassembling Voron 2.4 front doors and heatbed

In order to get ready to install this kit, you have to disassembly various segments of the original 3d printer, this part will guide you through entire process of preparation and getting ready to install new parts.

\*Please be aware some original parts will be discarded and won't be installed.



Figure 1. Assembled Heatbed

### Step 2.1 Removing front door parts

- ✓ Remove all brackets, panels and hinges from both front doors.

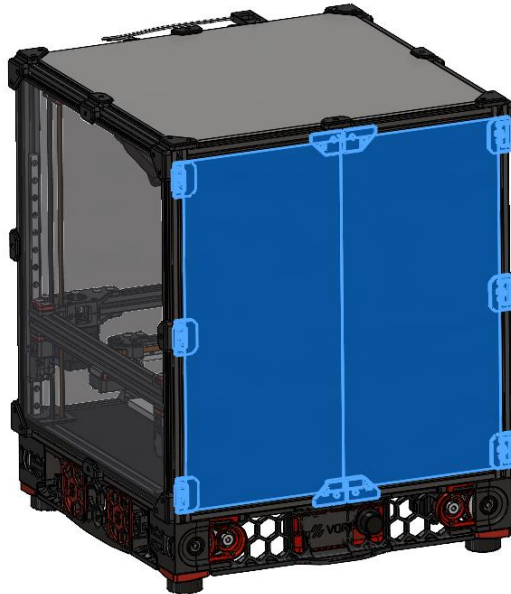


Figure 2 remove highlighted parts

### Step 2.2 Removing Heatbed

- ✓ Before starting to remove the heatbed, we need to secure both DIN rails that holds all the electronic components, so we flip the printer carefully and remove the bottom panel.
- ✓ After that, we use the printed BRACKET\_DIN\_RAIL\_X4.STL part and secure the DIN rails using 4 units M4x8 screws and 2 units T-nuts on each bracket as shown in the next picture.

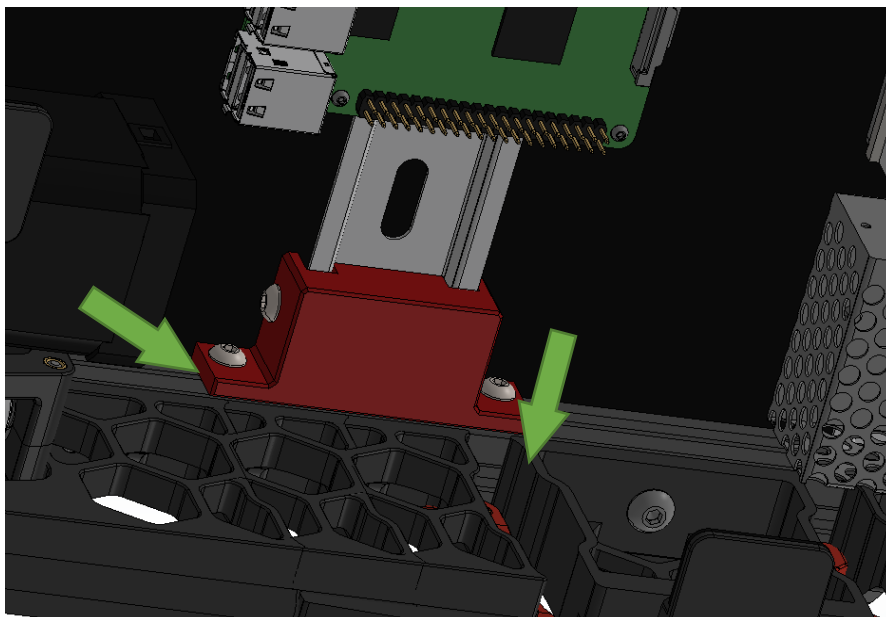


Figure 3 Securing DIN rails before removing heatbed bars

- ✓ We remove heating bed at this point, by releasing 4 units M3 bolts that holds it down, it is highly recommended to remove any magnetic base plate, and clean the aluminum heatbed with IPA in order to remove any glue from it:

\*Note: Do not disconnect the heatbed from the electronics, just keep it loose for next steps.

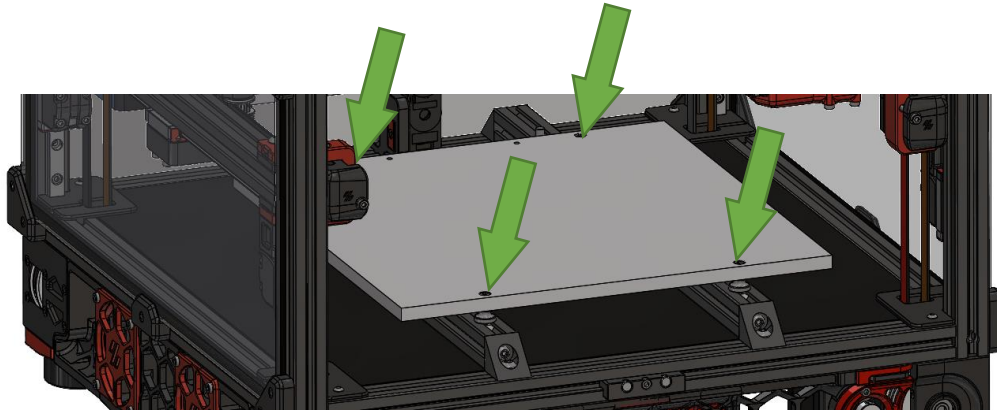


Figure 4 Removing heatbed screws

- ✓ Now we can securely remove both 2020 aluminum bars that holds the heatbed, by removing the 4 screws on each side, you have to disconnect cable from the Z endstop unit, since it won't be used:

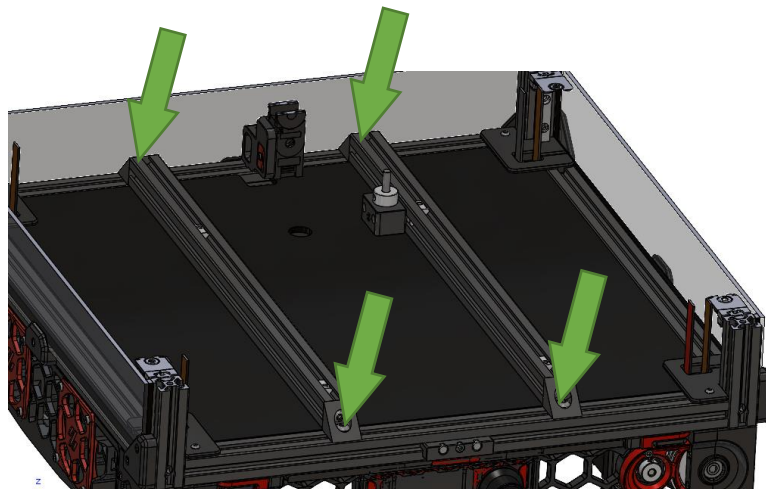


Figure 5 Removing heatbed support bars

## Chapter 3 Preparing frame

- ✓ We are pretty much ready to install our kit.

### Step 3.1 Installing bottom plates

- ✓ Let's identify each bracket part first:

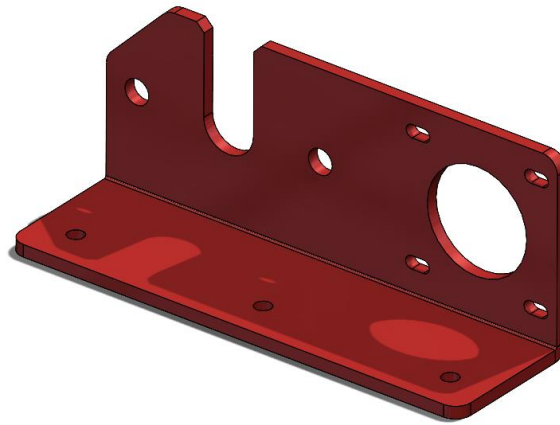


Figure 6: P1 VC90 BACK LEFT BRACKET

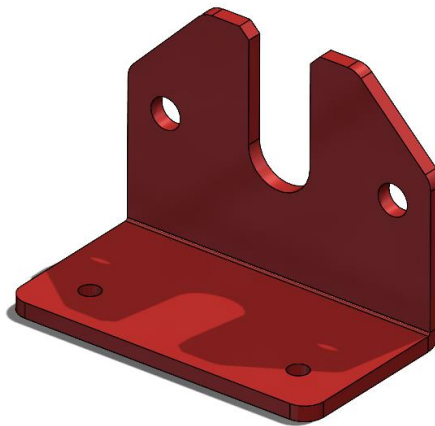


Figure 7: P2 VC90 BACK RIGHT BRACKET

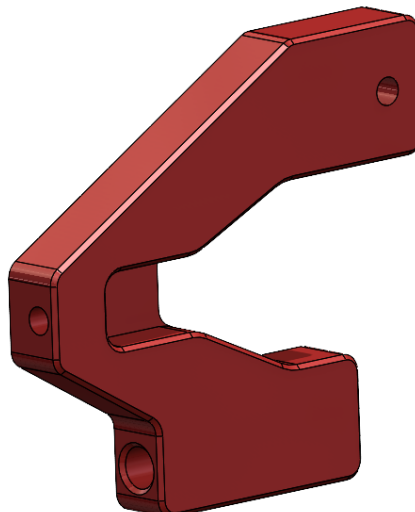


Figure 8: P3 VC90 CNC FRONT LEFT BRACKET

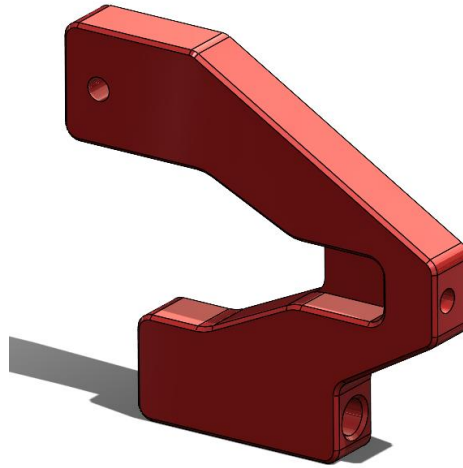


Figure 9: P4 VC90 CNC FRONT RIGHT BRACKET

- ✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	P1 VC90 BACK LEFT BRACKET	1	Kit
2	P2 VC90 BACK RIGHT BRACKET	1	Kit
3	P3 VC90 CNC FRONT LEFT BRACKET	1	Kit
4	P4 VC90 CNC FRONT RIGHT BRACKET	1	Kit
5	M5 x 20 mm Screw	2	Kit
6	M5 x 50 mm Screw	2	Kit
7	M5 T-Slot nut	4	Kit
8	M4 x 8 mm Screw	5	Kit
9	M4 T-Slot nut	5	Kit

- ✓ Install 2 CNC bracket plates as shown in the next picture, M5 screws and M5 T-slot nuts will be used, left and right sides must be assembled:



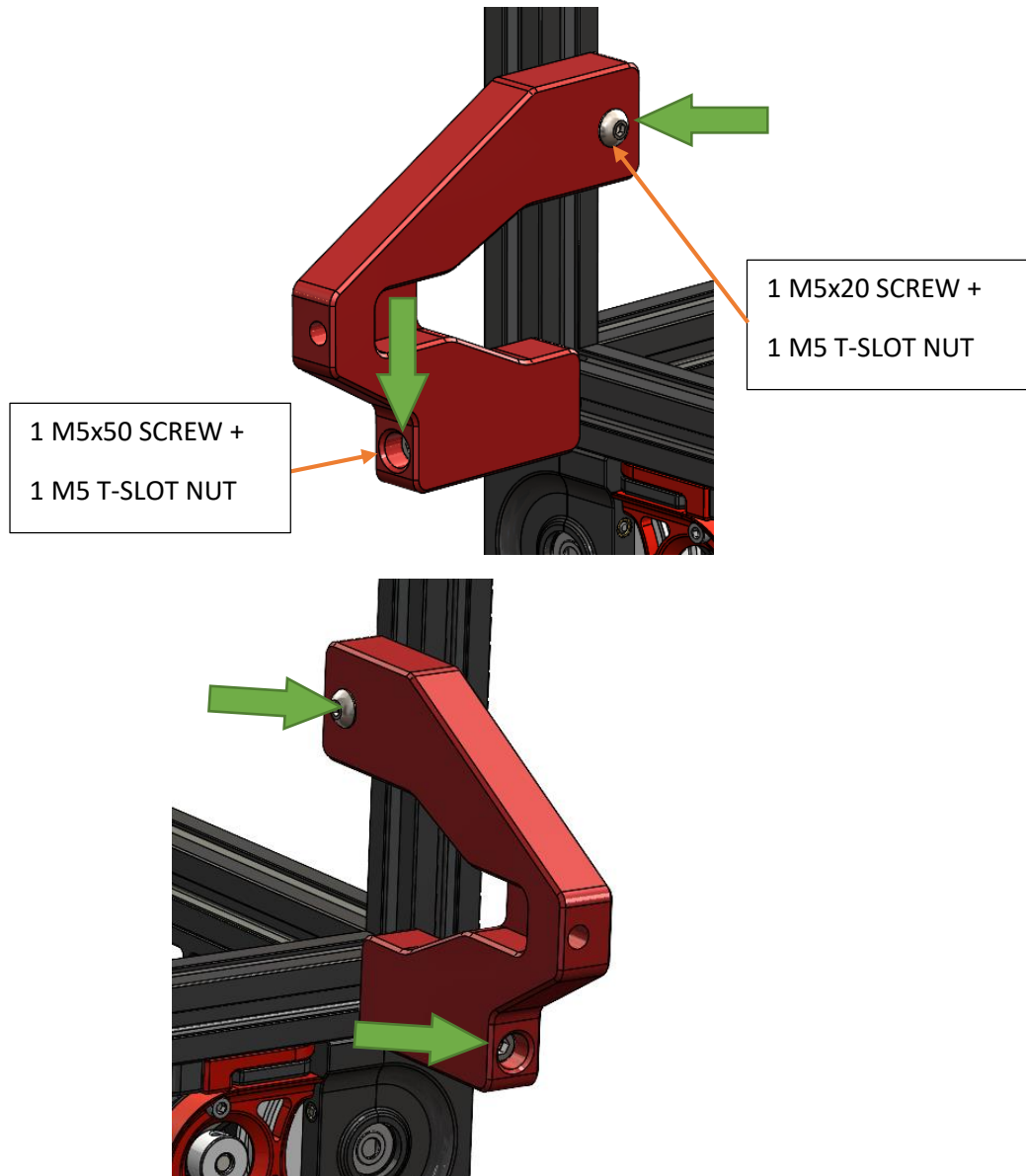
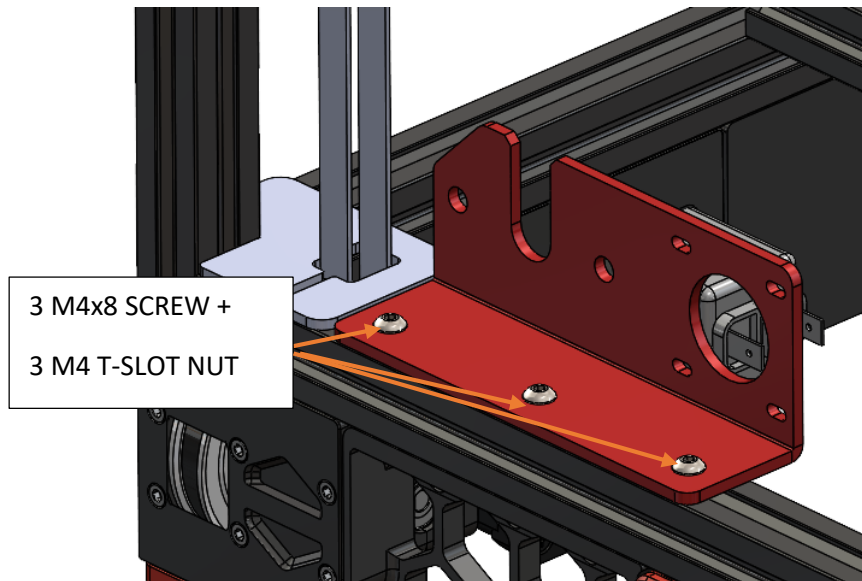


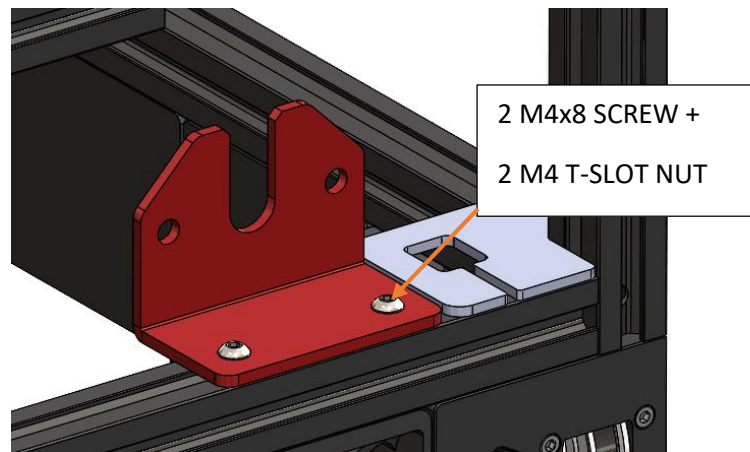
Figure 10 Installing front CNC brackets on each corner of bottom frame

- ✓ Install 2 back bracket plates as shown in the next picture, M4x8 screws and M4 T-slot nuts will be used, left and right sides must be assembled, they have to be installed right next to the timing belt cover:  
Note: If necessary and for easier mounting, is highly recommend to remove side panels to reach those brackets and other parts from the conveyor system





*Figure 11 Left back side bracket*



*Figure 12 Right back side bracket*

## Chapter 4 Installing Belt and Heatbed system

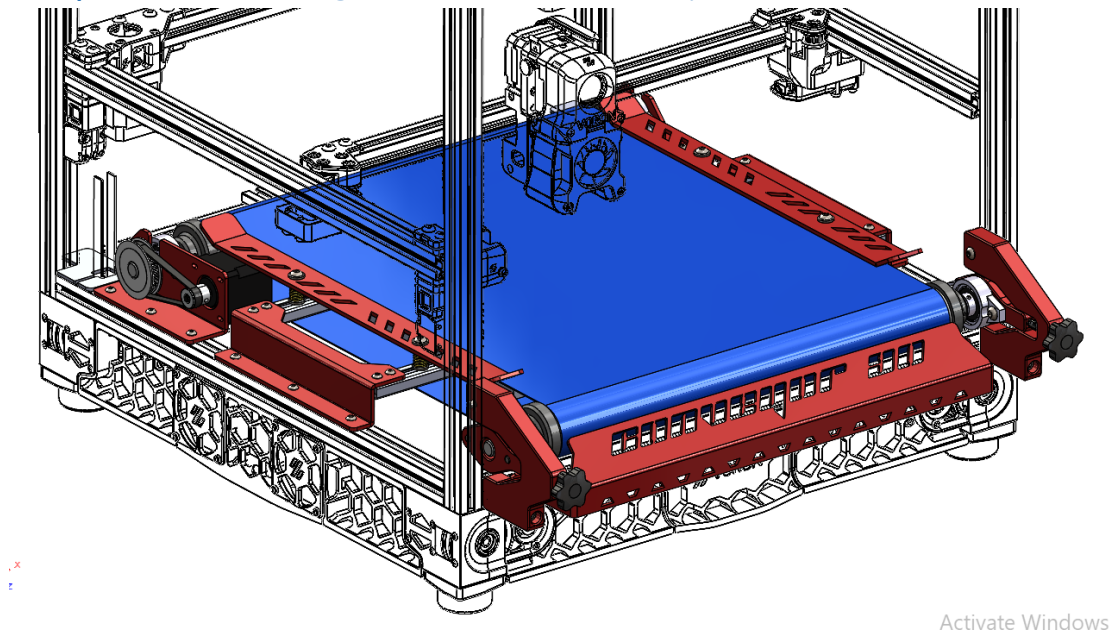


Figure 13 Belt system Assembly

### Step 4.1 Preparing rollers

- ✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Roller BODY 40 mm	2	Kit
2	12 mm ROD	2	Kit
3	Roller Cap 46mm	4	Kit
4	M4x8mm Black Headless screw	8	Kit

- ✓ Using all the mentioned parts, proceed to assemble them in the next order, first place 12mm ROD inside Rolle BODY 40mm, then insert Roller CAP 46mm on each end, making sure it all fits very tight, keep in mind that 12mm ROD have to be placed according to the next pictures. Finally using an allen key, proceed to secure both ROLLE CAP 46mm with the M4x8mm BLACK HEADLESS SCREWS (02 on each side):

\*Note: You have to repeat this process in order to get 2 rollers assembly.

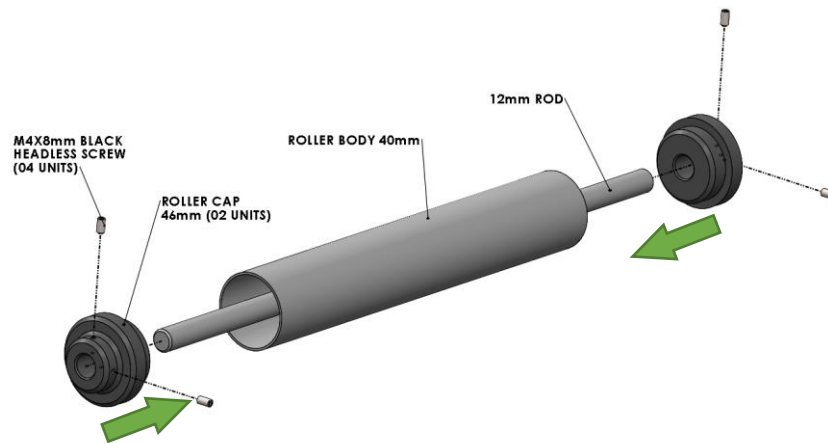


Figure 14 Roller assembly components



Figure 15 Back roller mounting dimensions



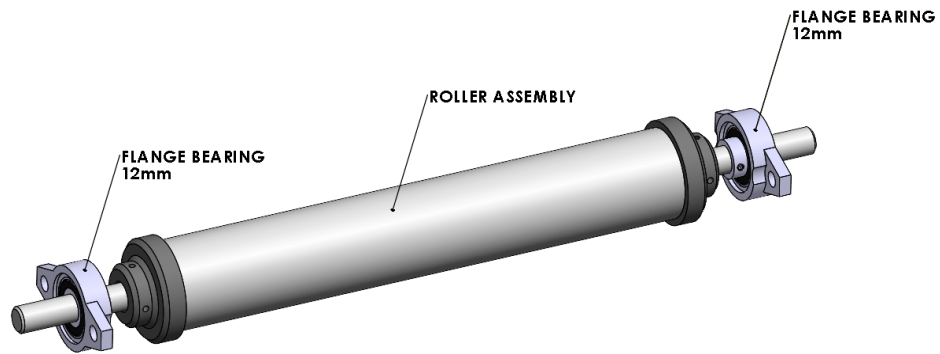
Figure 16 Front roller mounting dimensions

## Step 4.2 Installing Rollers and Belt

- ✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Roller Assembly	2	Kit
2	FLANGE BEARING 12mm	4	Kit
3	M6x16mm SCREW	8	Kit
4	M6 NYLOCK NUT	4	Kit
5	BELT	1	Kit
6	Timing Pulley 60T, Bore 12mm GT2	1	Kit
7	GT2 Timing belt Closed Loop	1	Kit
8	Y MOTOR with GT2 PULLEY	1	Kit
9	M3X6 SCREW	4	Kit
10	M6 Knobs	2	Kit

- ✓ Insert Flange Bearing 12mm on both sides of one of the Roller:



- ✓ Mounting the back roller: at this point insert the back roller through the Conveyor Belt:

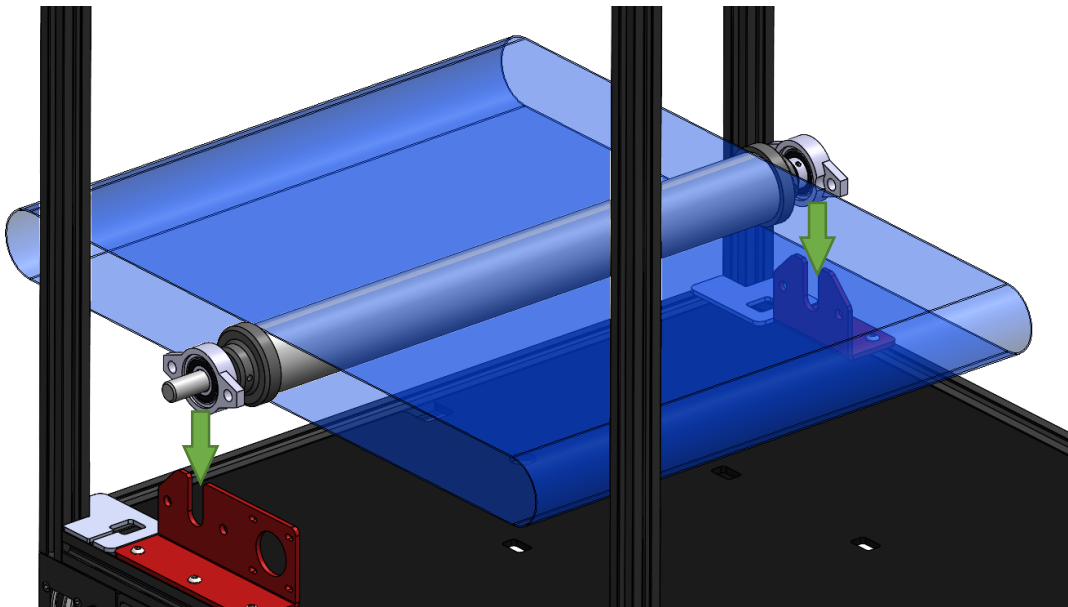


Figure 17 Back roller mount

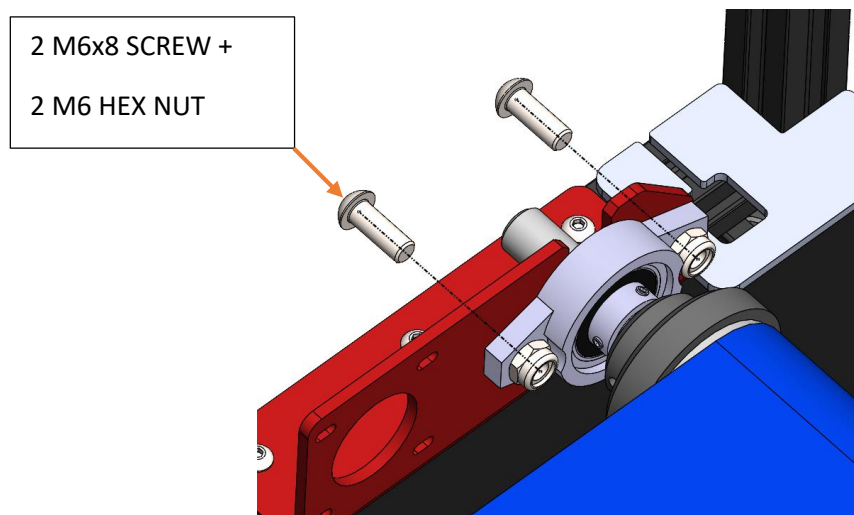
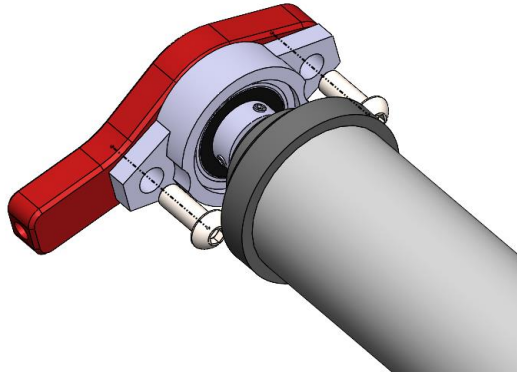


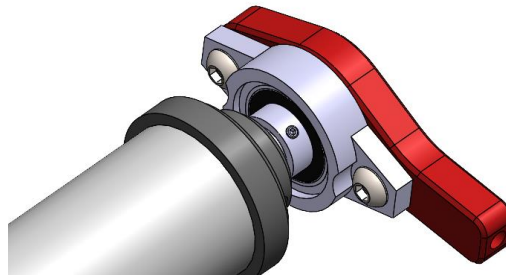
Figure 18 Fix the bearing with M6x16 Screw and M6 Hex nut, on both sides

- ✓ **FRONT ROLLER MOUNT:** Take the FRONT ROLLER with FLANGE BEARINGS on it, install it with M6x30 SCREWS into front CNC TENSIONERS MOVING ELEMENT:

**ROLLER HAS TO BE CENTERED!**

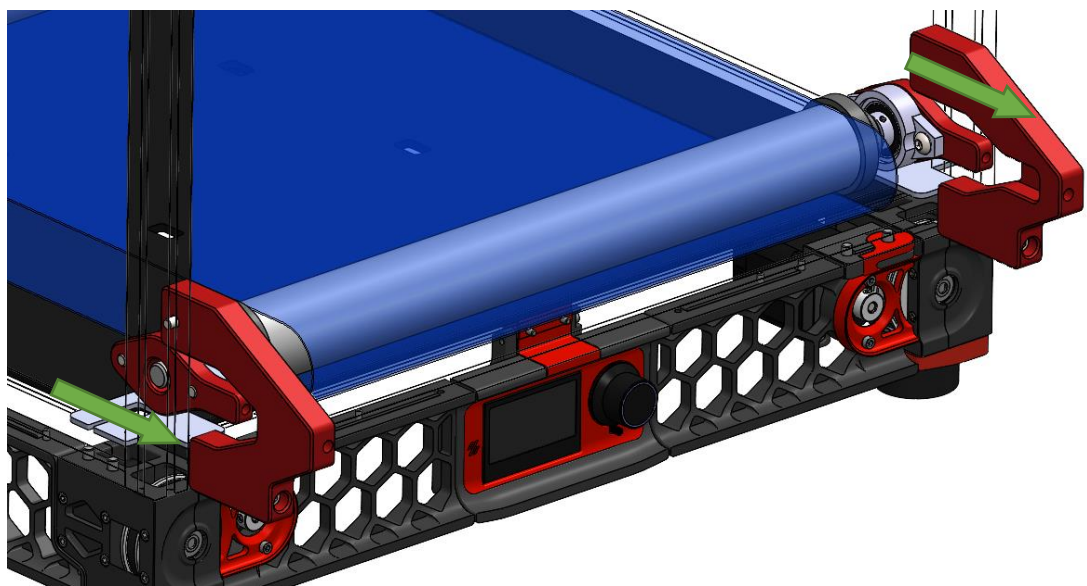


*Figure 19 Fix with M6x16 screws*



*Figure 20 Repeat with the right side*

- ✓ Insert this new FRONT ROLLER assembly through the Conveyor belt, and slide it on the CNC TENSIONERS slot, and insert both sides M6 Knobs supplied in the kit:



*Figure 21 Mounting front roller assembly*

- ✓ Insert both sides M6 Knobs supplied in the kit:

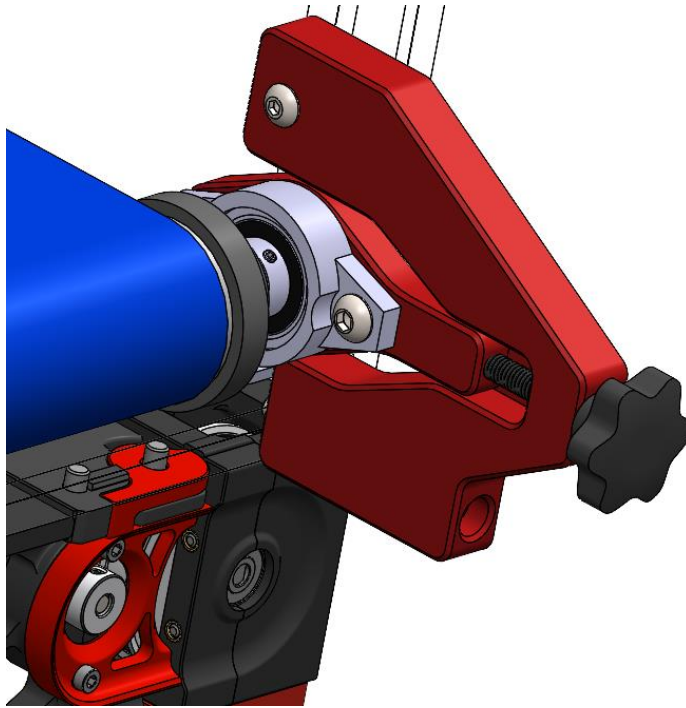


Figure 22 Inserting M6 Knobs on both sides

- ✓ **Belt tensioning:**

One way to check for the right belt tension and alignment is to roll the belt by hand and it have to move easy, smooth and straight without wobbling or needing to apply too much force.

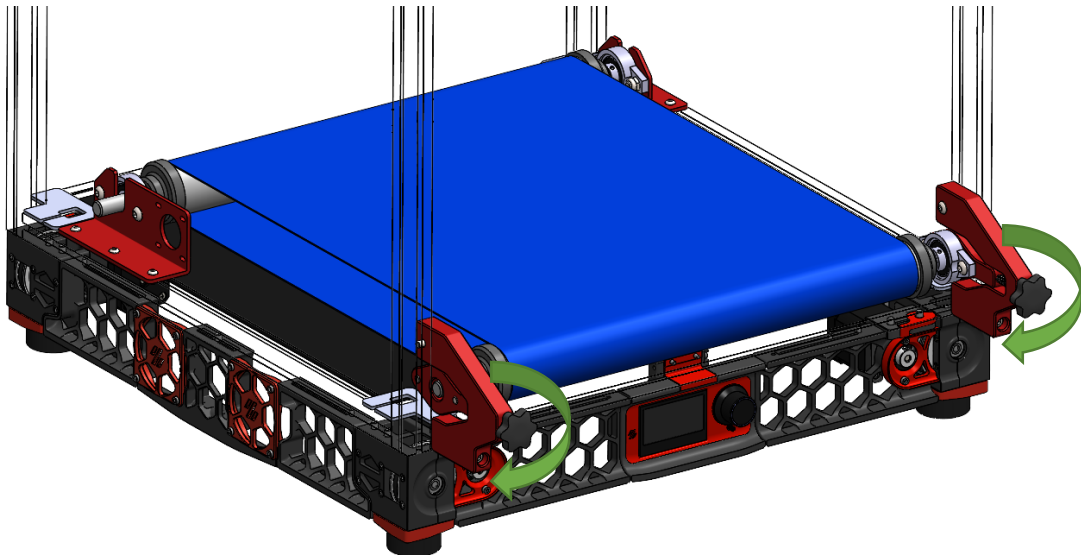


Figure 23 Measuring axes on right side



- ✓ **Belt motor installation:** On the LEFT FRONT side of machine, take the **Timing Pulley 60T**, bore 12mm GT2 and insert it on the end of the REAR ROLLER, then using the original Y motor and pulley (using M4x8mm Screws and M4 slot nuts), proceed to install it. At this point place the **GT2 Timing Belt Closed Loop** and align both pulleys, then adjust the motor bracket in order to tension the closed loop belt. As shown in the next picture:

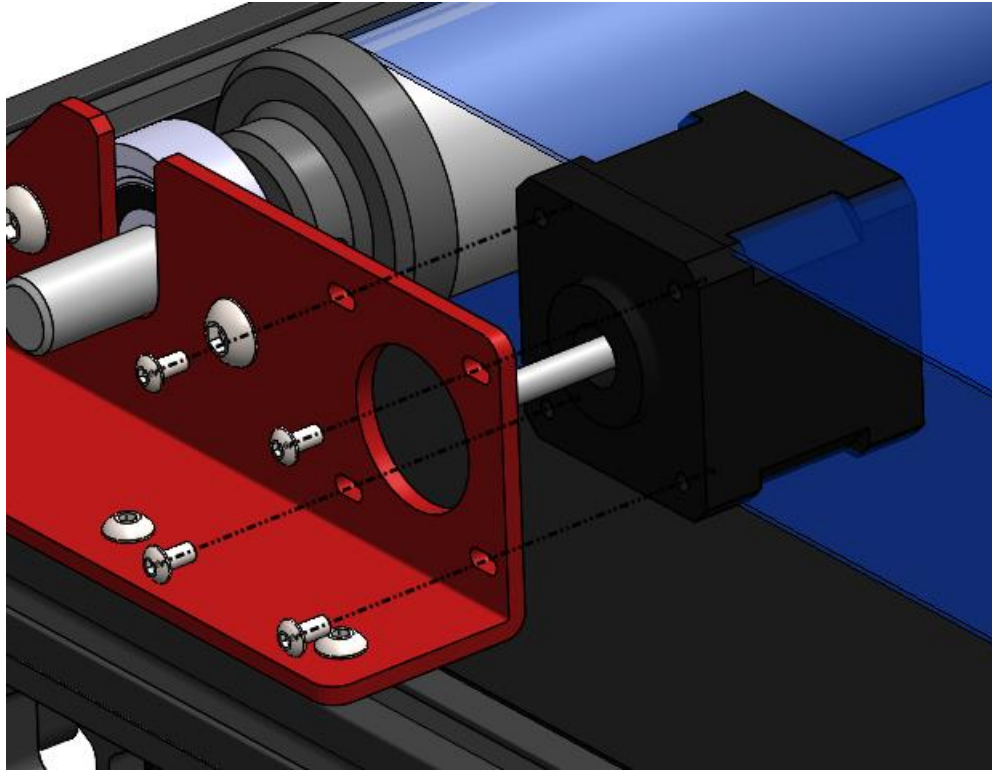


Figure 24 Insert included Nema 17, using M3x6 screws, don't tight them yet

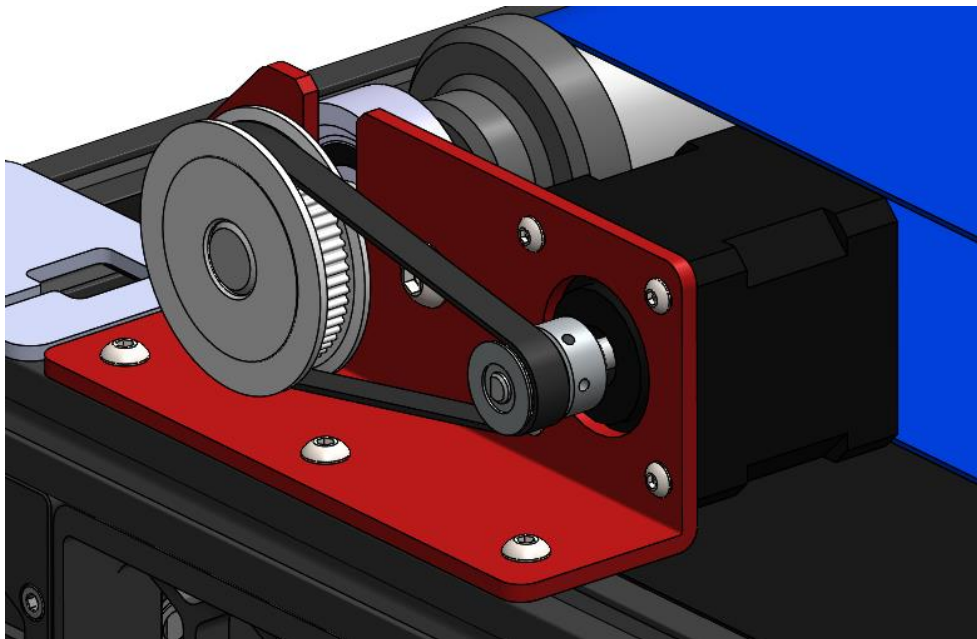


Figure 25 GT2 closed belt + 60T GT2 Pulley and 20T GT2 Pulley, tension and adjust motor screws



### Step 4.3 Mounting Heatbed

- ✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Original Heatbed without magnetic sheet	1	Original Part
2	Heatbed mount plate	2	Kit
3	1020 ALU PROFILE	2	Kit
4	M4x8 mm SCREW	10	Kit
5	M4 Slot nut	10	Kit
6	M5x8 mm SCREW	4	Kit
7	M5 Slot nut	4	Kit

- ✓ **Preparing Heatbed base plate:** Take original Heatbed, M4 knurled nuts, M3 screws and M3 T-nuts, and mount over the 2 units 1020 ALU PROFILE as shown, heated bed has to be centered:

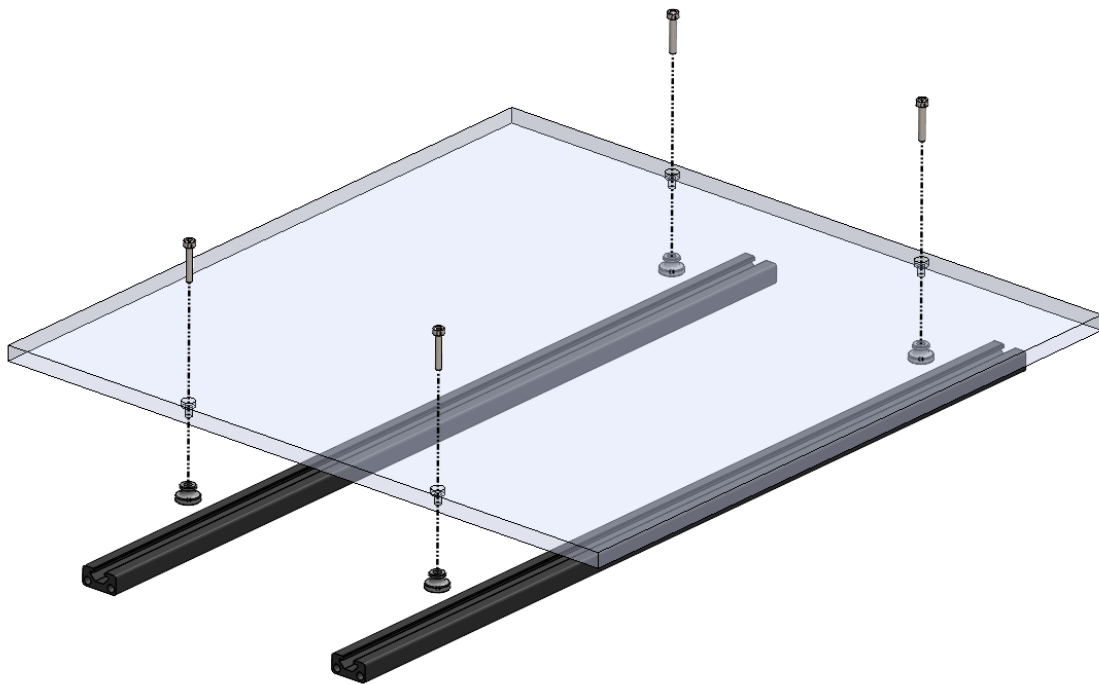


Figure 26 Heatbed base plate without wheels and showing aligned holes pairs.

- ✓ **Installing heatbed Assembly:** Install heat bed element back again.
- ✓ Proceed to insert Heated bed with support alu bars assembled, from the left side of machine right under the tensioned BELT. (cable of heatbed will come out from the left side to the machine and going to the electronic compartment)

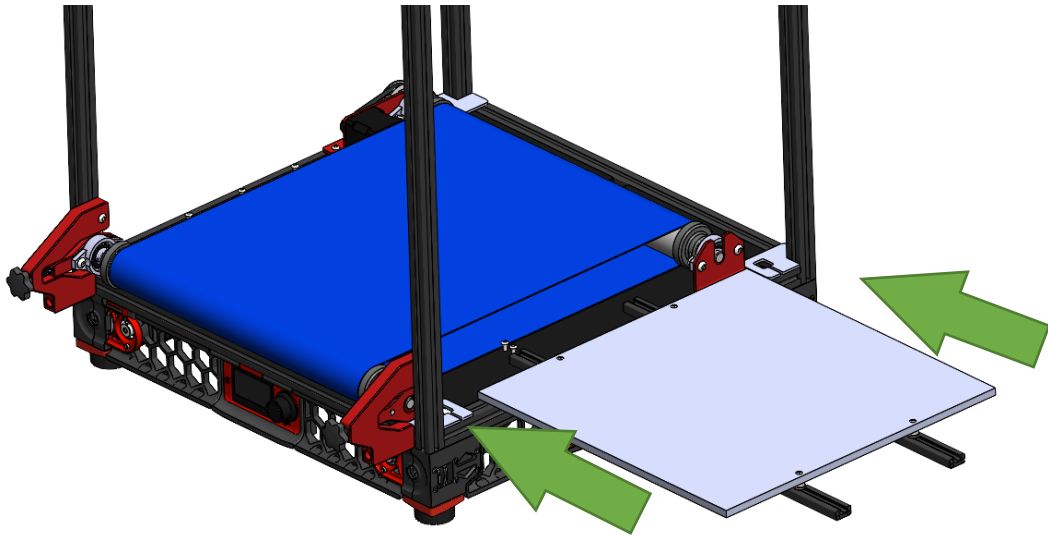
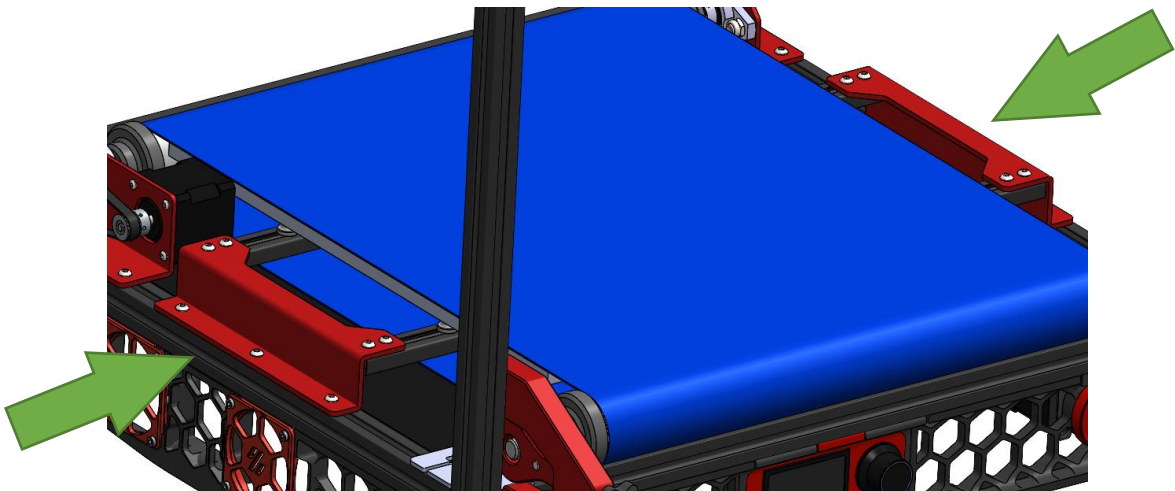


Figure 27 Heatbed must be inserted inside belt

- ✓ Using Heatbed mounting plates (Fixed by M4x8mm Screws + M4 T-Slot Nuts, 7 units on each side), install Heatbed assembly as shown in the next picture:



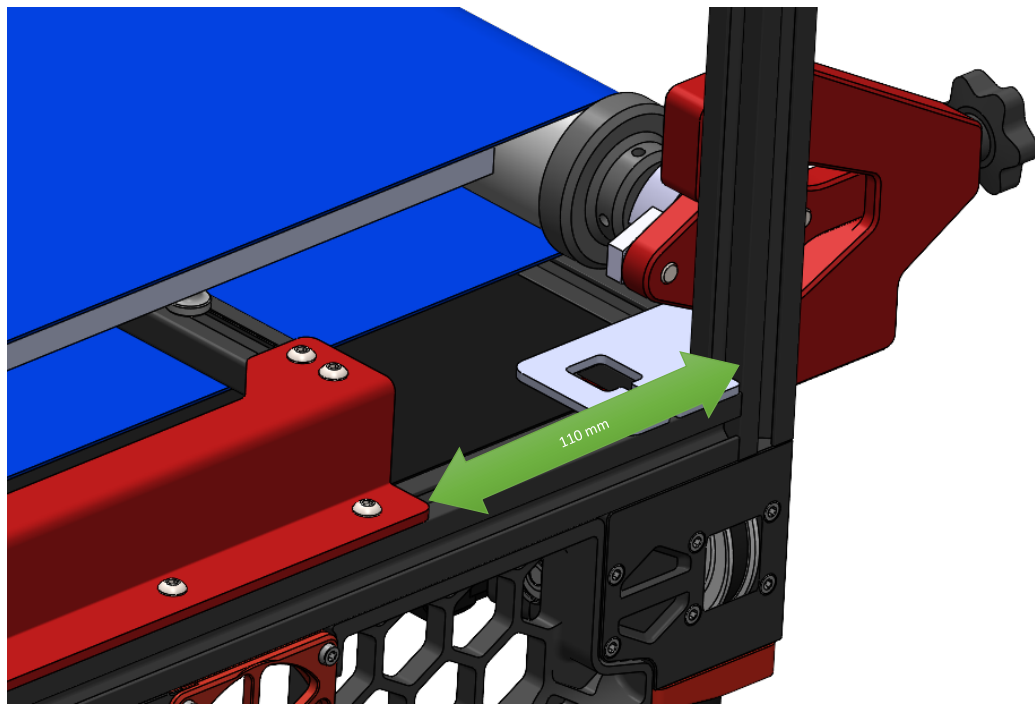
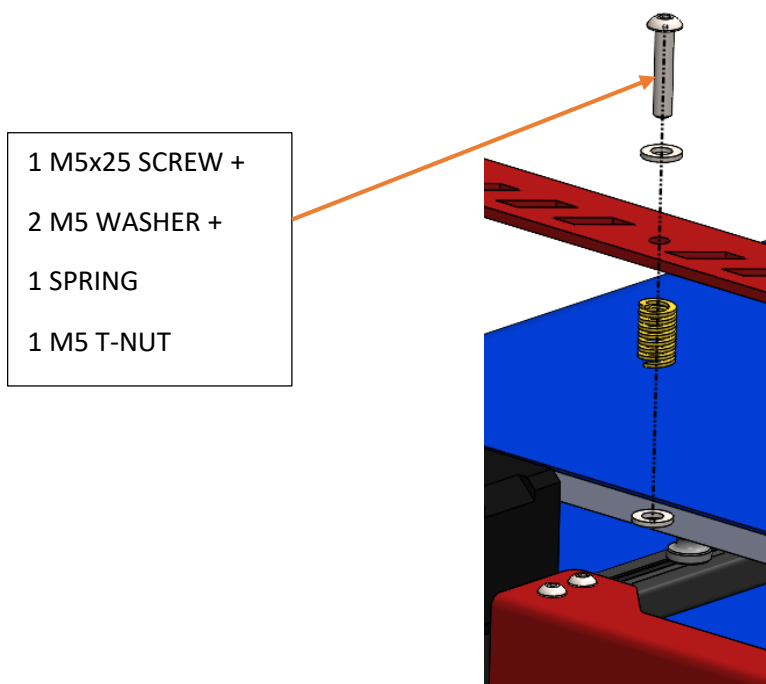


Figure 28 Internal dimension should be 110mm

## Chapter 5 Finishing installation

### Step 5.1 Belt holders mounting

- ✓ Belt holders on each side of the Conveyor belt will help to reduce possible warping and better stability for the belt once printing over it, in order to install them follow the next scheme and repeat on the opposite side, after that slightly adjust the screws, in order to get even and slightly pressure over the belt, belt holder should overlap the belt for about 10 mm or less on each side:



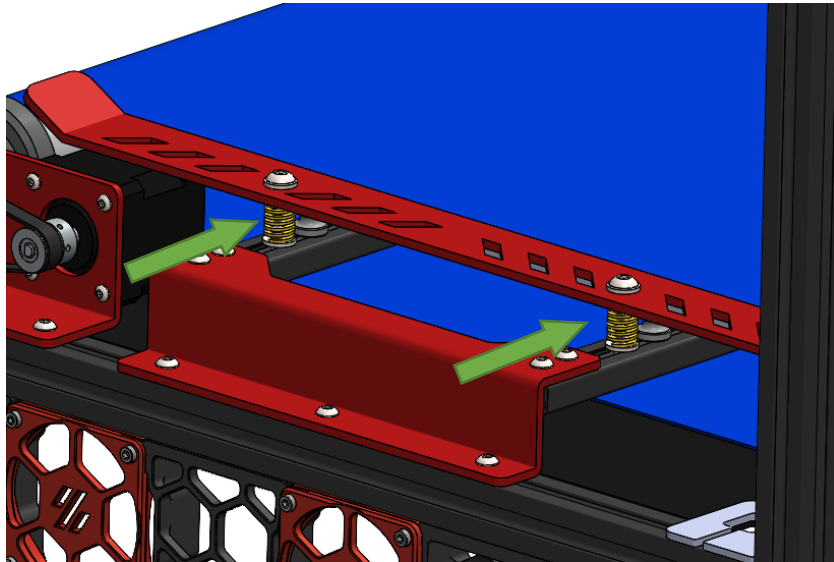


Figure 29 Belt holder installed, repeat on the left side

## Step 5.2 Face plate mounting

- ✓ Install provided face plate into the front of the machine, using 2 units M5x8 screws and M5 T-nuts, place it centered on the printer:



Figure 30 Install face plate, keeping a gap of 2mm from the belt

## Step 5.3 Installing front STRIP CURTAIN

- ✓ Strip curtain is required to keep heat inside the chamber, and also for letting parts to come out easily from the belt.
- ✓ Use supplied top bracket in order to fix all the strips to the top frame, using M4x8 screws and M4 T-nuts, you can use a piece of blue tape to pre-arrange them first over a table for easy mounting, overlap is about 12mm for each strip:

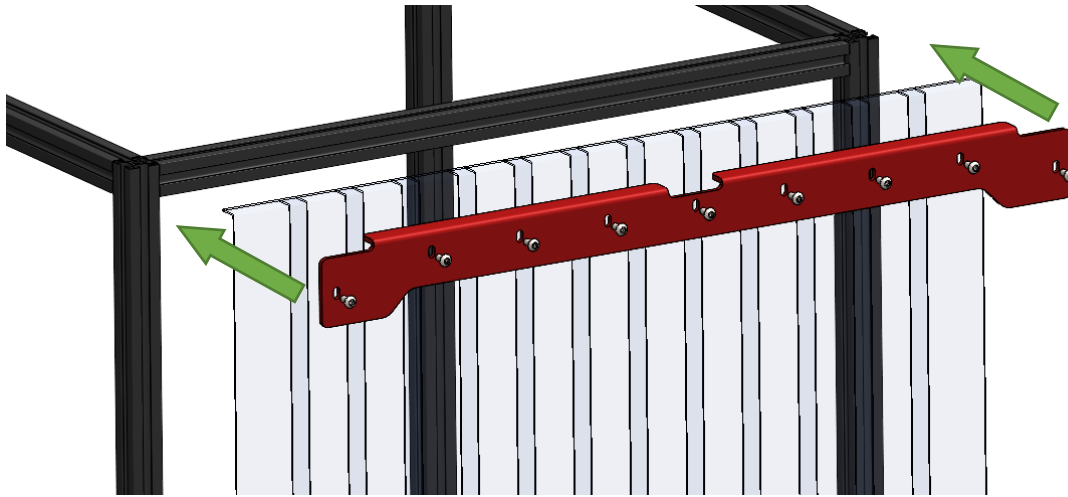


Figure 31 Curtain mounting

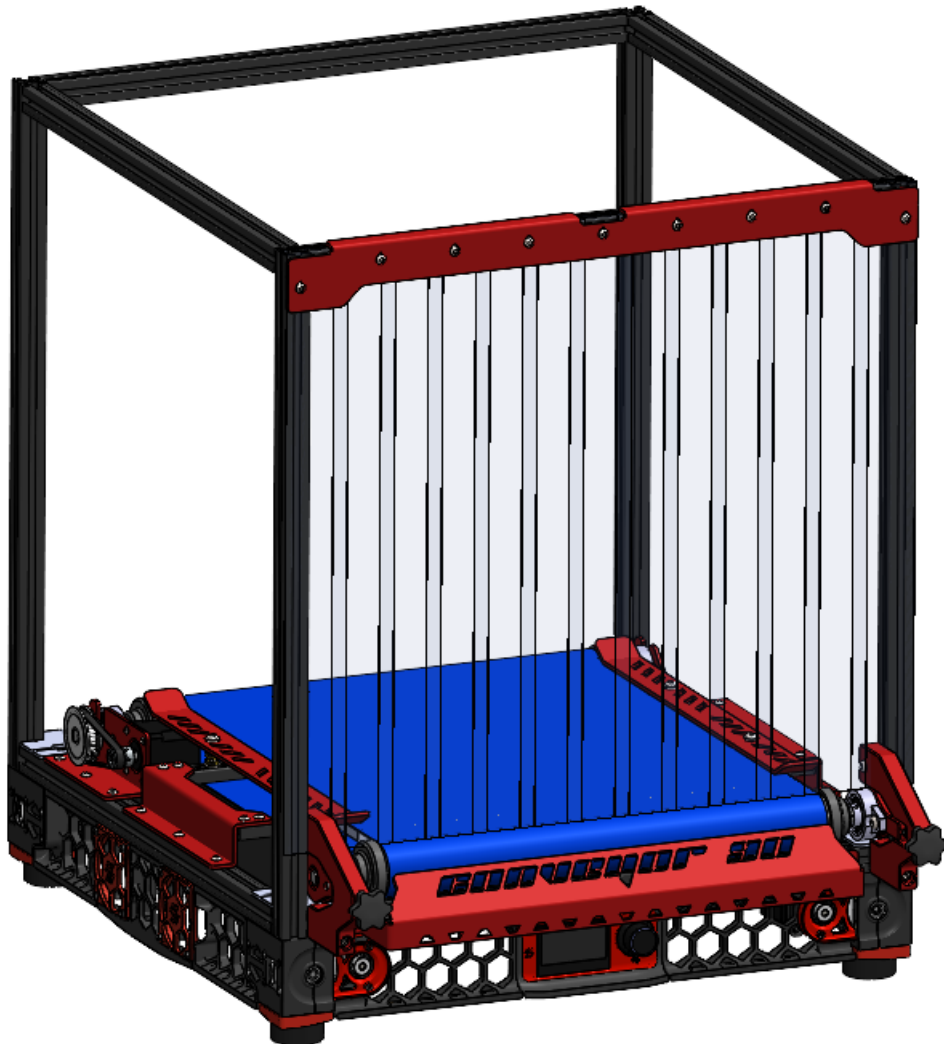


Figure 32 Final result for Conveyor belt mounting

- ✓ Finally, mount original side panels back with its hardware.

## Chapter 6 Klipper and firmware settings

Changes That You Will Need to Make To Add The Voron Belt. This configuration is for an Octopus 1.1 mainboard so you will need to make the proper changes to your pin configuration based on the board you have.

You will need to use a Klicky, Euclid, BL Touch for the Z endstop as you will have to remove your Manual Z endstop switch. If you leave your smooth flexible steel sheet on the aluminum print surface then place it under the belt you can use an inductive probe such as the PL-05N, OMRON, or generic inductive probe to Probe for Z height and QGL.

If you copy and paste from this document right click and paste in (Plain Text or Without Formatting) to prevent coding issues

```
#####
```

```
# #      (EDIT HIGHLIGHTED ITEMS) Z Stepper Settings
```

```
## This version is configured the the standard inductive probe that comes with most kits
```

```
## If you are using a different style probe you will have to change the setting to work for
```

```
## your probe. THE STEAL SMOOTH SHEET MUST BE ATTACHED TO THE ALUMINUM
```

```
## BUILD SURFACE AND BE BELOW THE BELT FOR THIS TO WORK!!
```

```
## DON'T SAY I DID NOT WARN YOU!!!
```

```
#####
```

```
## Z0 Stepper - Front Left on MOTOR2_1
```

```
[stepper_z]
```

```
step_pin: PF11
```

```
dir_pin: PG3
```

```
enable_pin: !PG5
```

```
rotation_distance: 40
```

```
gear_ratio: 80:16
```

```
microsteps: 32
```

```
endstop_pin: probe:z_virtual_endstop    #Use Probe For Endstop
```

```
## Z-position of nozzle (in mm) to z-endstop trigger point relative to print surface (Z0)
```

```
## (+) value = endstop above Z0, (-) value = endstop below
```

```
##      Increasing position_endstop brings nozzle closer to the bed
```

```
## After you run Z_ENDSTOP_CALIBRATE, position_endstop will be stored at the very end of your config
```

```
#position_endstop: -0.5
```

#####

## (ADD THIS SECTION TO YOUR BELT STEPPER) Printer Belt Stepper Settings

## This Defines The Motor For The Belt Assembly

#####

## manual\_stepper belt\_drives - Left Side Of Belt Drive Assembly

## Connected to motor on belt system

## Driver 7 On BTT Octopus 1.1 Main Board

## You Will Have To Change Pinout Information For Other Main Boards

## No End Stop

[manual\_stepper belt\_drives]

step\_pin: PE6

dir\_pin: PA14

enable\_pin: !PE0

rotation\_distance: 40

gear\_ratio: 1:3

microsteps: 32

full\_steps\_per\_rotation:200

[tmc2209 manual\_stepper belt\_drives]

uart\_pin: PD3

interpolate: false

run\_current: 1.5

hold\_current: 0.80

sense\_resistor: 0.110

stealthchop\_threshold: 0



#####

## Z Safe Homing

## This is setup for a 350mm build volume

#####

##CHANGE Your Z Safe Home section to move the nozzle to the center of the bed for z homing

[safe\_z\_home]

## XY Location of the Z Endstop Switch

## Update -10,-10 to the XY coordinates of your endstop pin

## (such as 157,305) after going through Z Endstop Pin

## Location Definition step.

home\_xy\_position:175,175

speed:50

Z\_hop:10

#####

# Macros (MAKE AND EDIT MACROS)

#####

#####

# G32 Macro

#####

[gcode\_macro G32]

gcode:

G28

QUAD\_GANTRY\_LEVEL

G28

```
#####  
#      Print Start Macro  
#####
```

```
[gcode_macro PRINT_START]
```

```
# Use PRINT_START for the slicer starting script - please customize for your slicer of choice
```

```
gcode:
```

```
G32          ; home all axes
```

```
G90          # Use absolute coordinates
```

```
G1 Z50 F3000 ; move nozzle away from bed
```

```
PRIME_LINE
```

#####

# Print End

#####

[gcode\_macro PRINT\_END]

gcode:

M400 ; wait for buffer to clear

G92 E0 ; zero the extruder

G1 E-10.0 F3600 ; retract filament

G91 ; relative positioning

G0 Z1.00 X20.0 Y20.0 F20000 ; move nozzle to remove stringing

SET\_HEATER\_TEMPERATURE HEATER=extruder TARGET=0 ;Turn Off Extruder

M107 ; turn off fan

G1 Z50 F3000 ; move nozzle up 30mm

G90 ; absolute positioning

G0 X345 Y345 F3600 ; park nozzle at rear

M190 S60 ; set bed temperature to 60C and wait You may have to adjust for your room bed temperature

G91 ; relative positioning

CLEAR\_BELT ; Move Belt at a slow speed to clear belt

TURN\_OFF\_HEATERS ; Turn Off All Heaters for safety fail safe

#####

## Belt Movement This defines how far and how fast your belt moves

## Slow and steady wins this race

#####

##Belt movement MACRO you can adjust speed and distance to move

[gcode\_macro CLEAR\_BELT]

gcode:

MANUAL\_STEPPER STEPPER=belt\_drives SET\_POSITION=0 MOVE=1200 SPEED=50 ; move  
Bed to remove parts

#####

## Nozzle Prime On Left Side Of Belt No Need For Skirt Priming Anymore :)

#####

# prime the nozzle on left front side of belt

[gcode\_macro PRIME\_LINE]

gcode:

M117 Prime Line

G92 E0 ;Reset Extruder

move z axis

G1 Z2.0 F3000 ;Move Z Axis up

move to prime position

G1 X20 Y50 Z0.75 F5000 ;Move to start position

G1 X20 Y200.0 Z0.75 F1500 E25 ;Draw the first line

G1 X20 Y200.0 Z0.95 F1500 ;Move up a little

G1 X20 Y50 Z0.95 F1500 E25 ;Draw the second line

G1 X20 Y50 Z1.15 F1500 ;Move up a little

G1 X20 Y200 Z1.15 F1500 E25 ;Draw the thirdline

G1 X20 Y200 Z1.35 F1500 ;Move up a little

G1 X20 Y50 Z1.35 F1500 E25 ;Draw the thirdline

G1 X20 Y30 Z0.20 F1000 ;Lower To Wipe Nozzle Prevent Stringing

G92 E0 ;Reset Extruder

G1 Z2.0 F3000 ;Move Z Axis up (Replaced With Below)

G0 X175 Y175 Z50 F5000