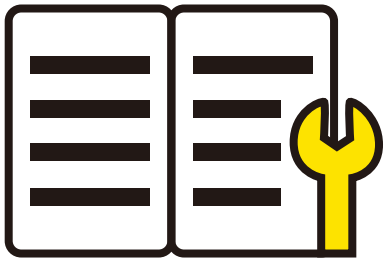
CHAOTICLAB

CNC VORON TAP V2 BUILD GUIDE

VERSION 2024-02-22

Version	Date	Revisions
v1.0	2023.10	·Original
v1.2	2024.02	·Added Section: “Connection Methods” with detailed instructions on the preferred and alternate methods. ·Instructions on the random shipment of connecting cable colors along with corresponding wiring diagram. ·Added: Connection diagram for use with BIGTREETECH EBB SB2209/2240 CAN and EBB SB2209 CAN (RP2040).



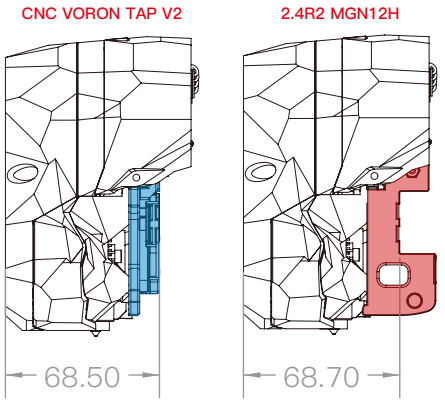
- Highlighted in blue are included in this **CNC VORON TAP V2**
- Highlighted in red are other accessories of the Voron printers, which are not included in this **CNC VORON TAP V2** and will need to be prepared by yourself.

Any unauthorized disassembly of this product may cause damage and void the warranty. In particular, do not detach the slider from the rail yourself.
If disassembly is necessary, first loosen the screws securing the sensor, then remove the PCBA circuit board. Follow this sequence strictly to avoid sensor damage.

Note: The two screws for securing the sensor are CM2, not M2. CM2 screws use a 1.3mm hex key, unlike M2 which uses a 1.5mm hex key.

XY TRAVEL INFLUENCE:

The thickness of the **CNC VORON TAP V2** is similar to that of the 2.4R2 X carriage, so no adjustments to the relevant settings are necessary.



HARDWARE REQUIREMENTS:

YOU MUST USE THE MGN12H X-AXIS

You must already be using the MGN12 based X-Axis. **CNC VORON TAP V2** does not fit on the older MGN9 based X-axis.

CW2 STYLE MOUNTED EXTRUDER REQUIRED

CNC VORON TAP V2 replaces the X-carriage mount, and requires that the mounting screws come in from the front of the carriage like CW2, not the back like CW1. There are mounts for LGX and Galileo available.

BED MOUNT MUST BE SECURE

When **CNC VORON TAP V2** is probing, the nozzle will contact the bed with a force of approximately 500-800 grams. Your bed should not move during this. Bed motion compromises the accuracy of **CNC VORON TAP V2**, so it is not recommended for Voron 1.8, Legacy, or Switchwire designs.
If you want to know if **CNC VORON TAP V2** is right for you, tap your finger on the bed firmly. If the bed moves, **CNC VORON TAP V2** is not right for you.

GOOD MECHANICAL CONDITION

CNC VORON TAP V2 is far more precise than previous Z sensing systems, and we have found it can reveal previously unnoticed problems in a printer. If your printer has known mechanical issues (such as cracked components) fix them before.

LUBRICATING LINEAR RAILS

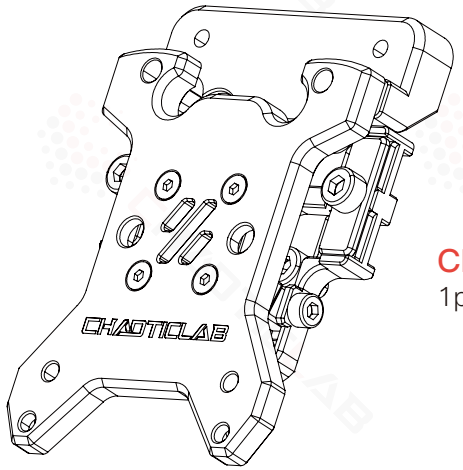
Linear rails ship with oil that is designed to prevent corrosion during the shipping and storage process. This oil should be replaced with a lubricant of your choice. We recommend using an NLGI0 or NLGI1 rated grease. WD–40 makes a good white lithium grease with a spray applicat or nozzle that works well in this application.

FOLLOW THE STEPS BELOW TO GREASE YOUR RAIL WITHOUT DISASSEMBLY:

1. Use WD–40 degreaser or another degreaser of your choice and spray directly into the ball bearing area indicated by the arrow. Ensure that you spray liberally on both sides and run the block up and down the rail several times after spraying.
2. Drop a few drops of isopropyl alcohol down the rail on either side to flush out the WD–40 degreaser.
3. Spray your lubricant on either side of the rail liberally and run the block up and down the rail repeatedly to allow the lubricant to reach all of the balls within the block.

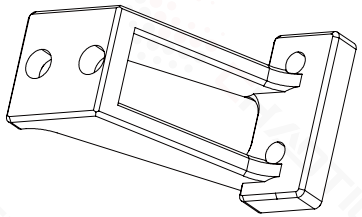
Table of Contents

Packing List



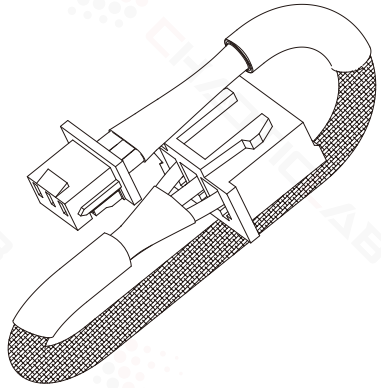
CNC Voron Tap V2

1pc



Limit Switch Bracket

1pc

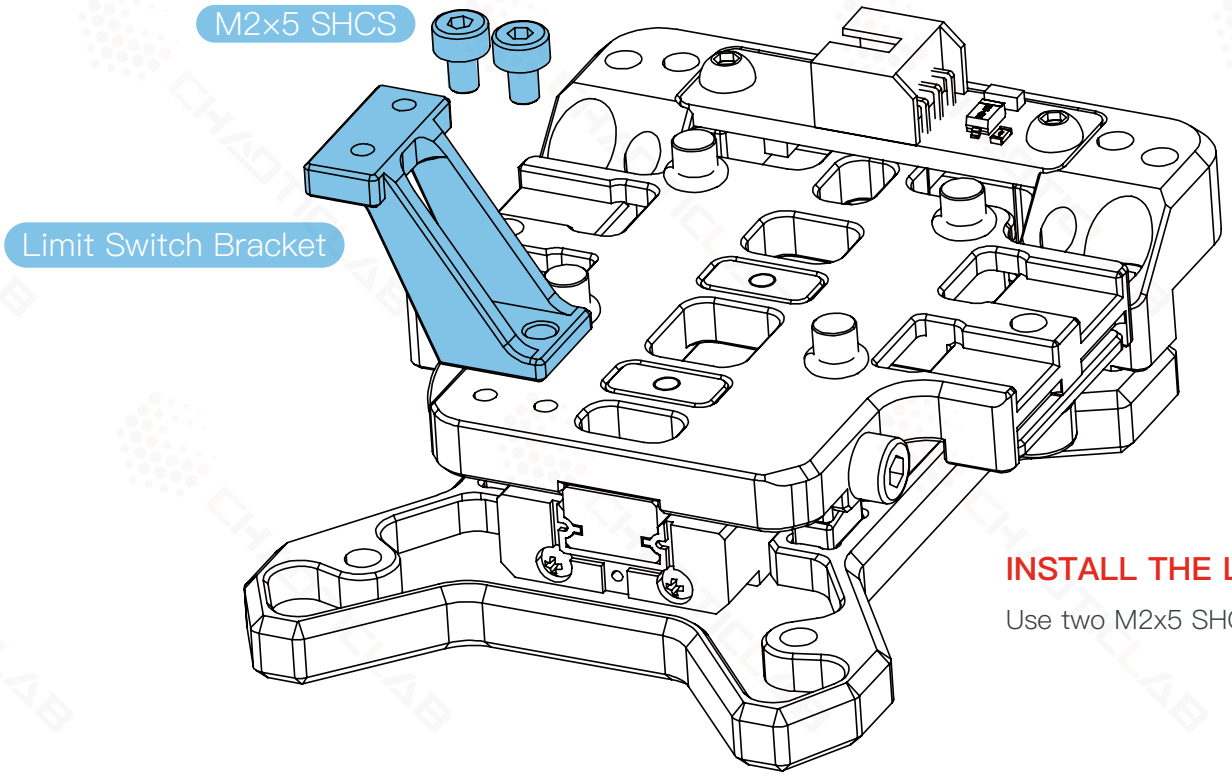


ZH1.5-3Pin to XH2.54-3Pin Cable (150 mm)

1pc

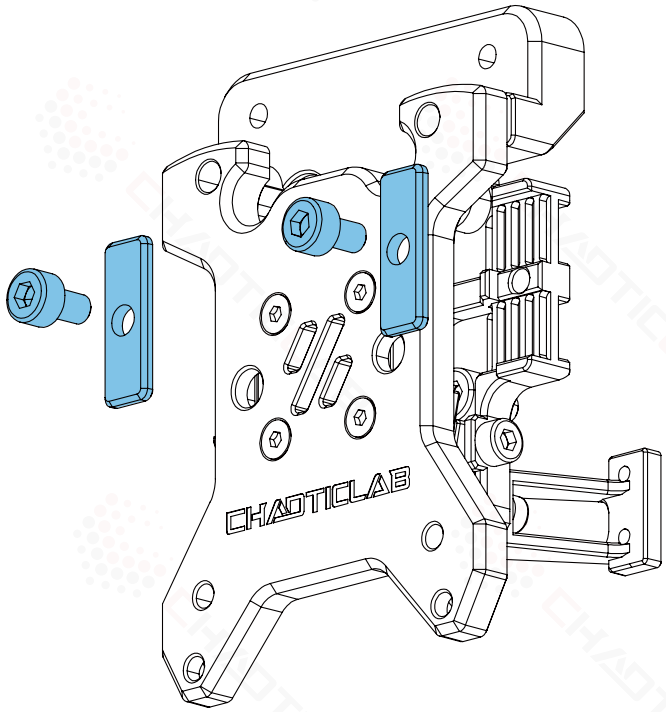
Socket Head Cap Screw (SHCS)

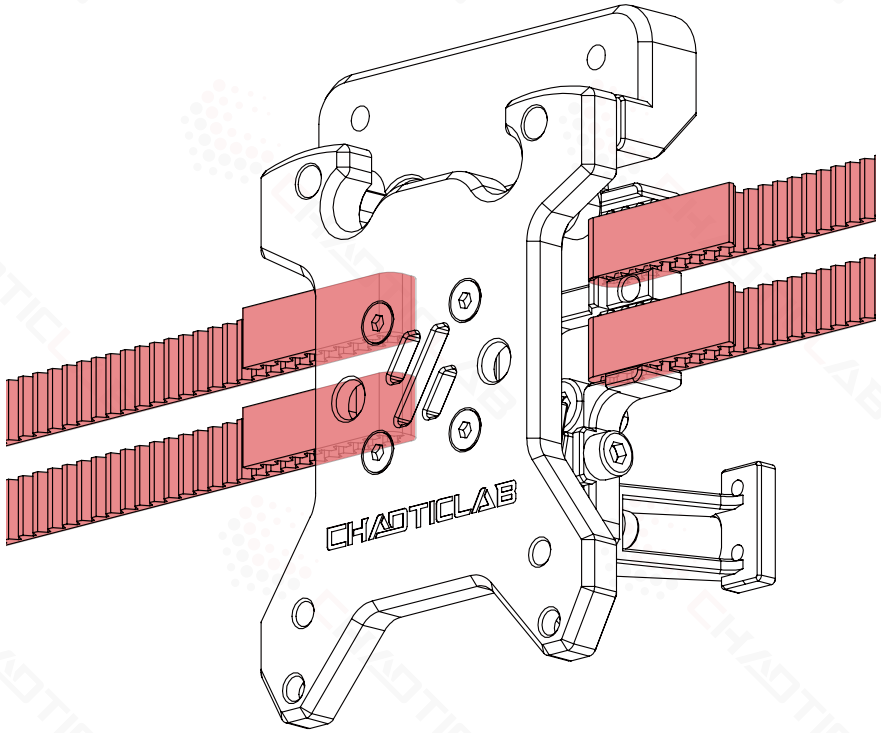
M3x12	2pcs
M2x8	2pcs
M2x5	2pcs



INSTALL THE LIMIT SWITCH BRACKET

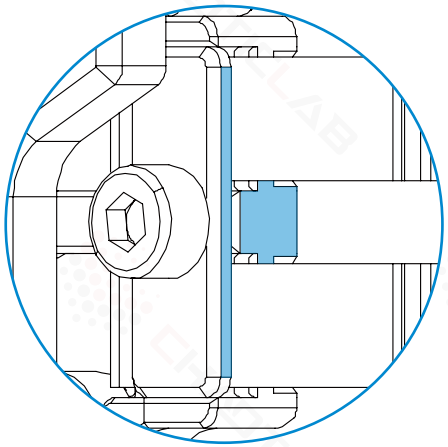
Use two M2x5 SHCS to fix the limit switch bracket to CNC VORON TAP V2.

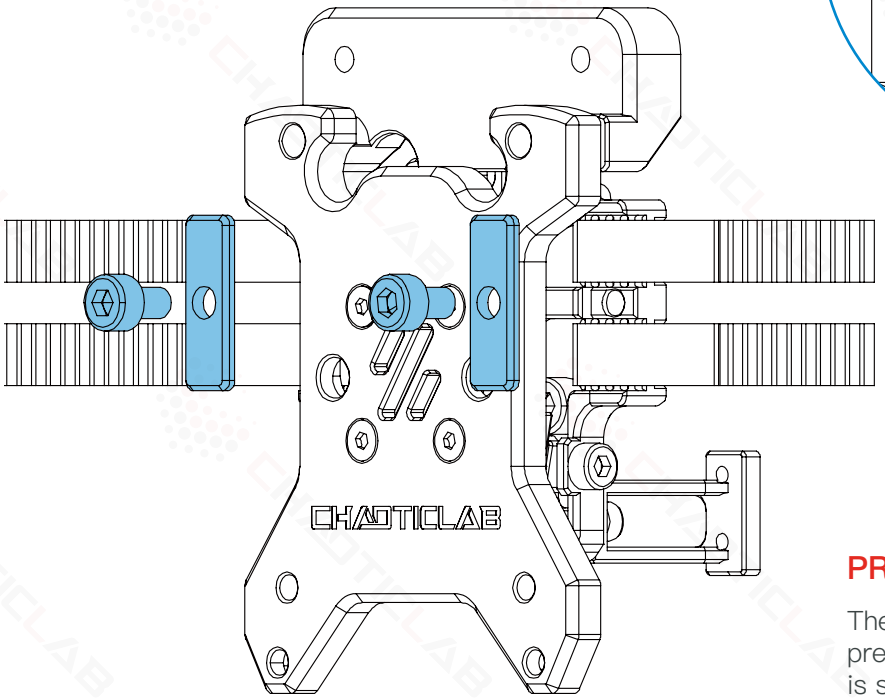




REMOVE THE BELT CLAMP

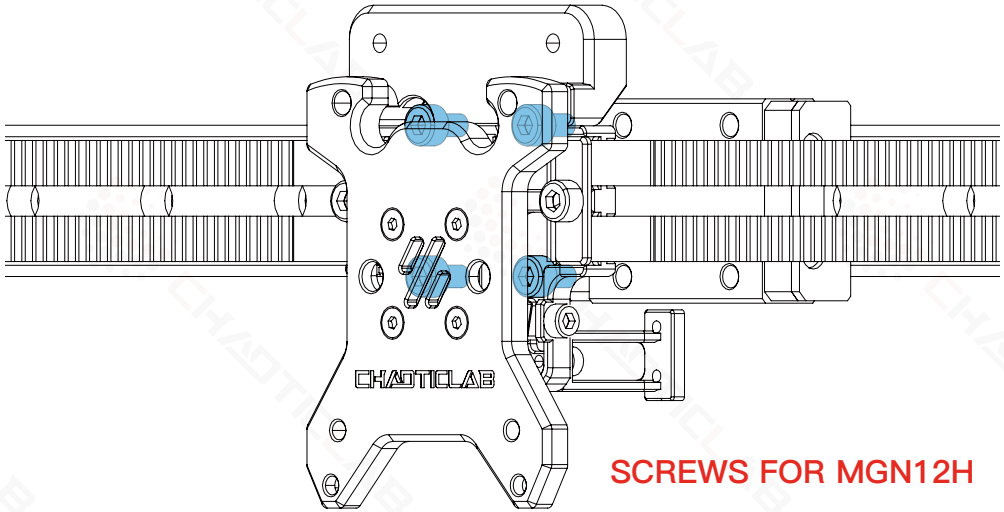
Before installing the belt, remove the M3x6 screws and the belt clamp.

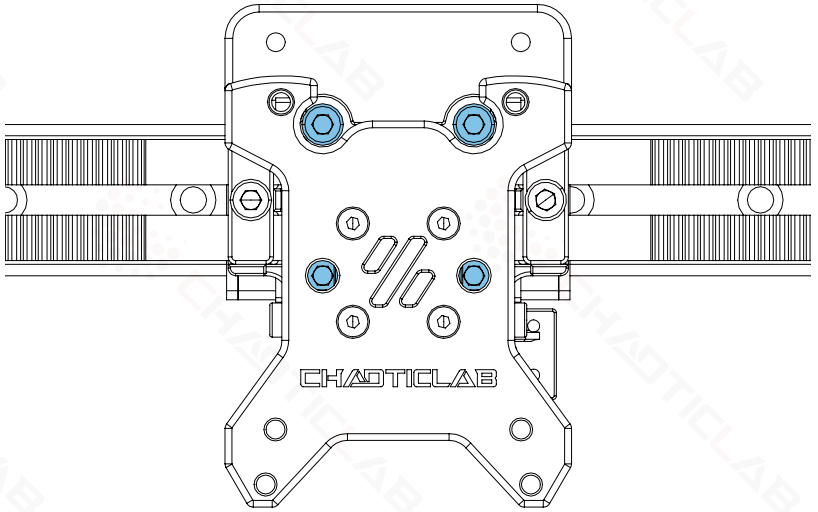




PROPERLY SEATING THE BELT

The belt groove is designed to be 6mm wide to precisely position the belt. Make sure the belt is seated in the groove before fully tightening the M3x6 screw on the belt clamp.



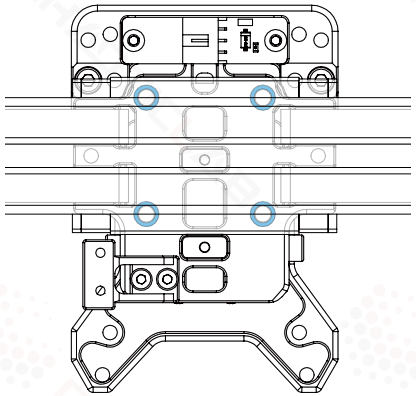


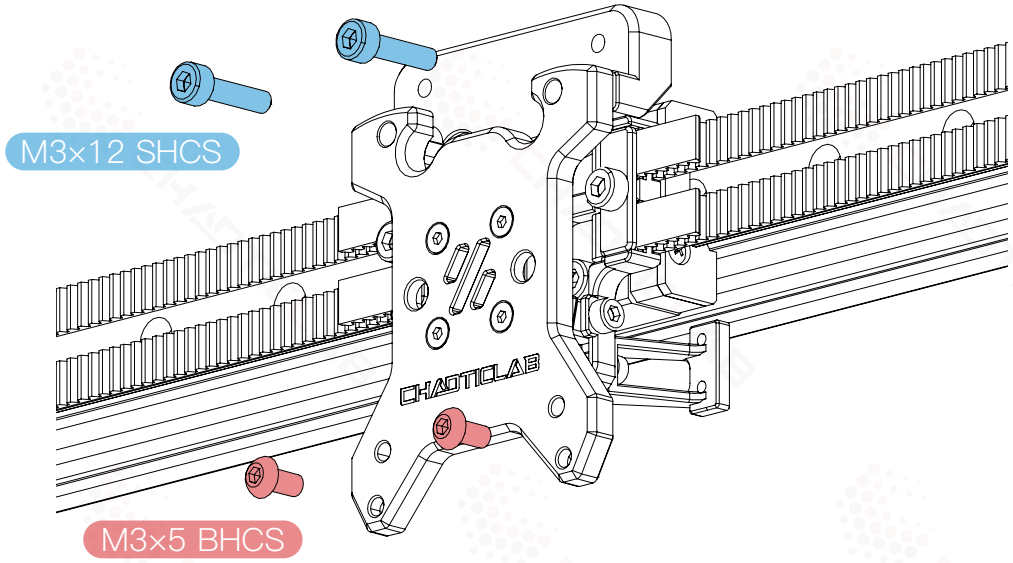
SCREWS FOR MGN12H

The CNC Voron TAP V2 comes pre-installed with four screws for mounting to the MGN12H rail. When tightening these screws, it is important to synchronize them and keep them locked at the same time. If you fully tighten one screw first, the other may not be able to tighten properly

DO NOT REMOVE RUBBER WASHERS

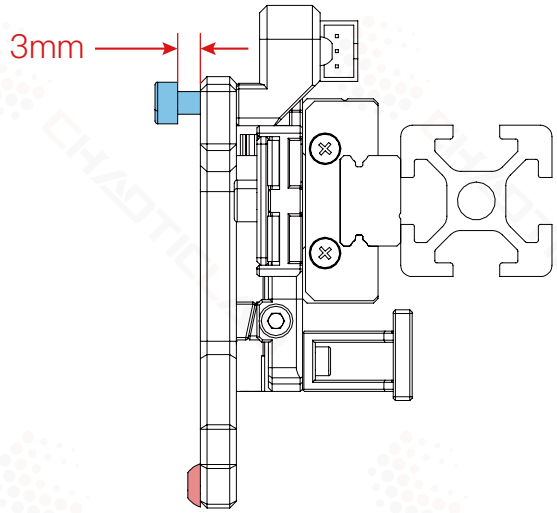
The four rubber washers on the back are there to prevent the screws backing out during installation. Do not remove them during assembly.





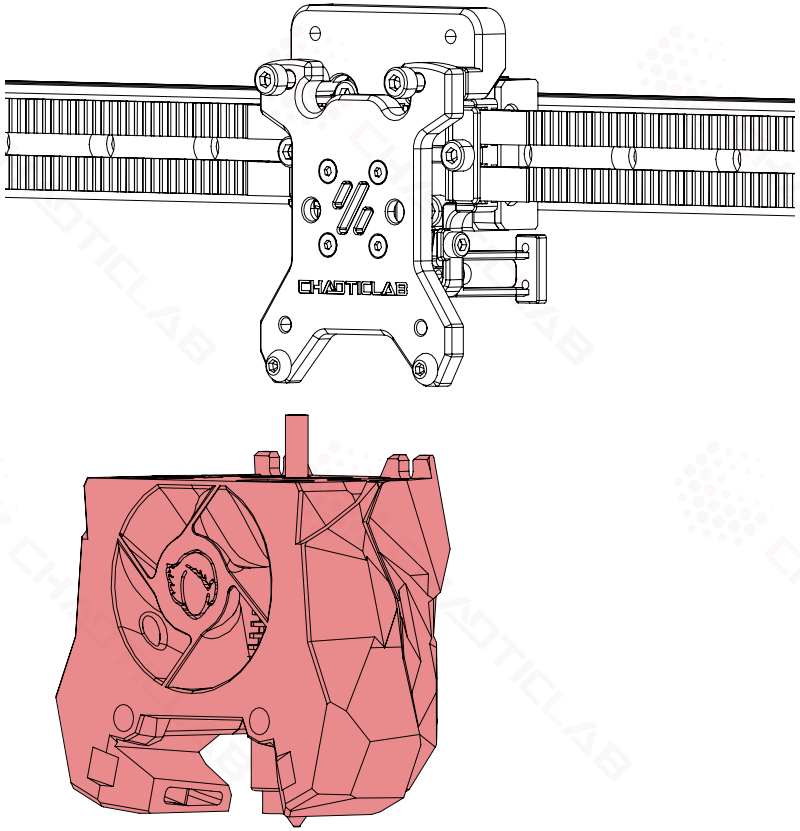
SCREWS FOR MOUNTING THE CW2

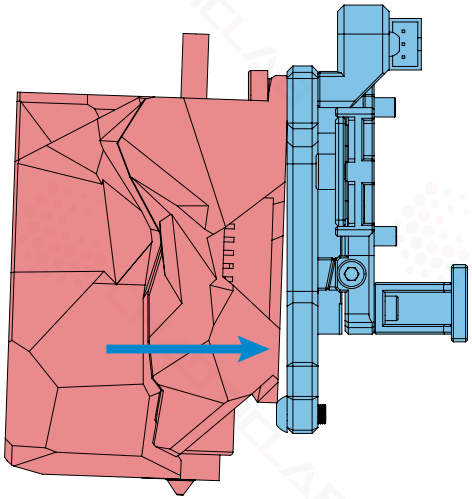
M3x5 BHCS is a commonly used size, M3x3 BHCS or even M3x2 BHCS may work better.

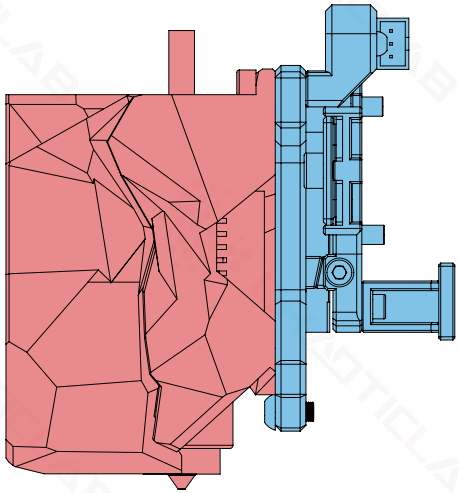


LEAVE ROOM FOR THE TOOLHEAD

Thread the M3 x 12 SHCS directly into the CNC part, but do not tighten fully. Leave approximately 3 mm of thread to allow clearance for mounting the toolhead.


CHAOTICLAB



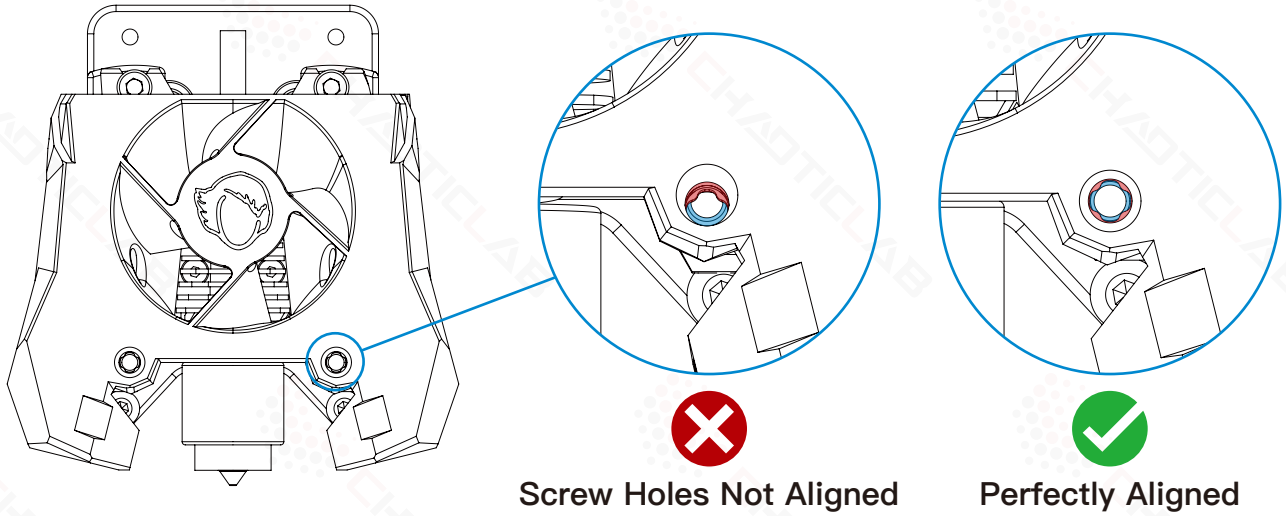


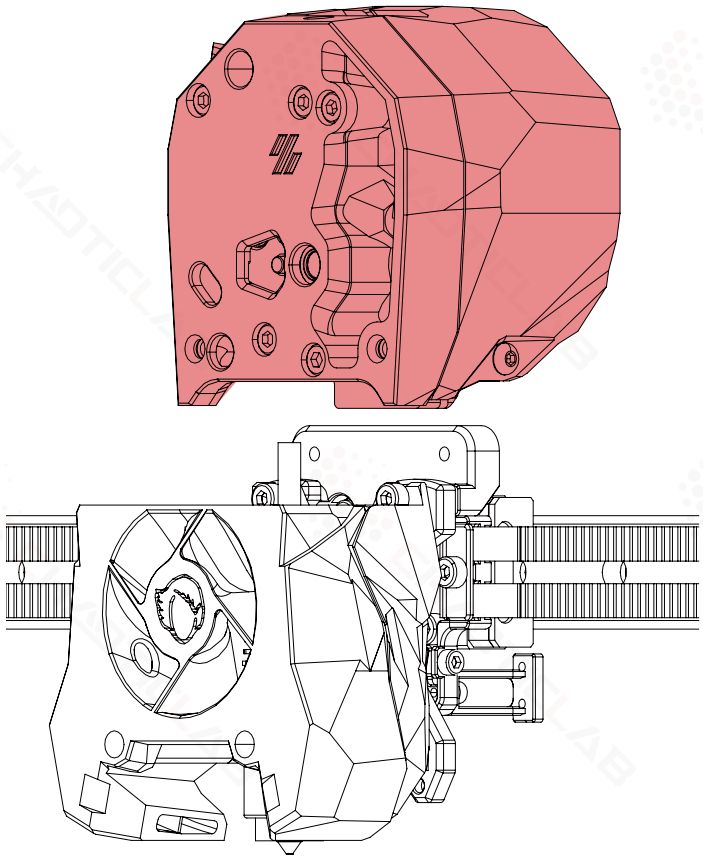
PRESS TOOLHEAD ONTO TAP

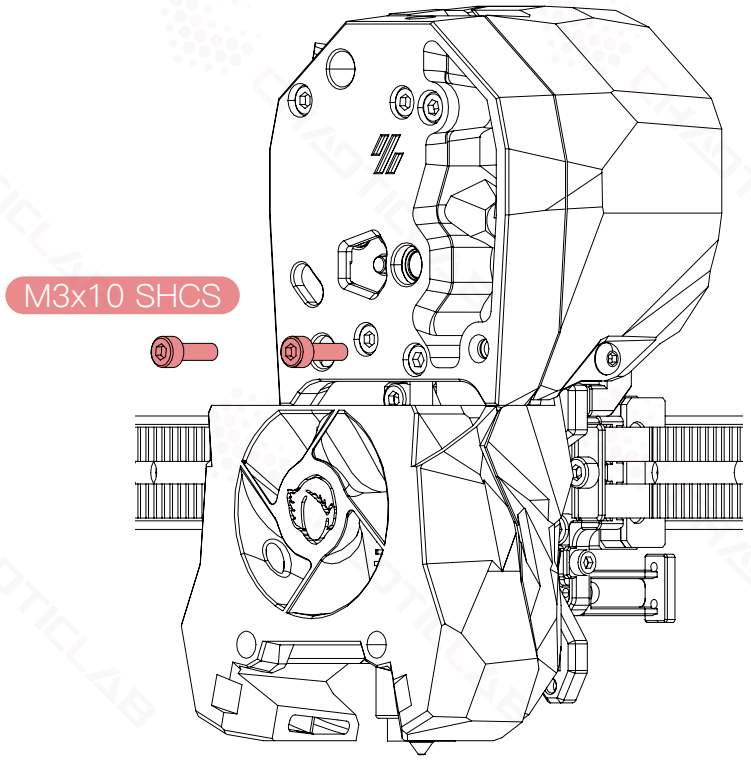
After inserting the tool head assembly into the 3mm gap left by the two M3x12 screws mentioned on page 05, please press the toolhead along the direction indicated by the blue arrow in the figure until the back of the tool head is completely attached to the TAP.

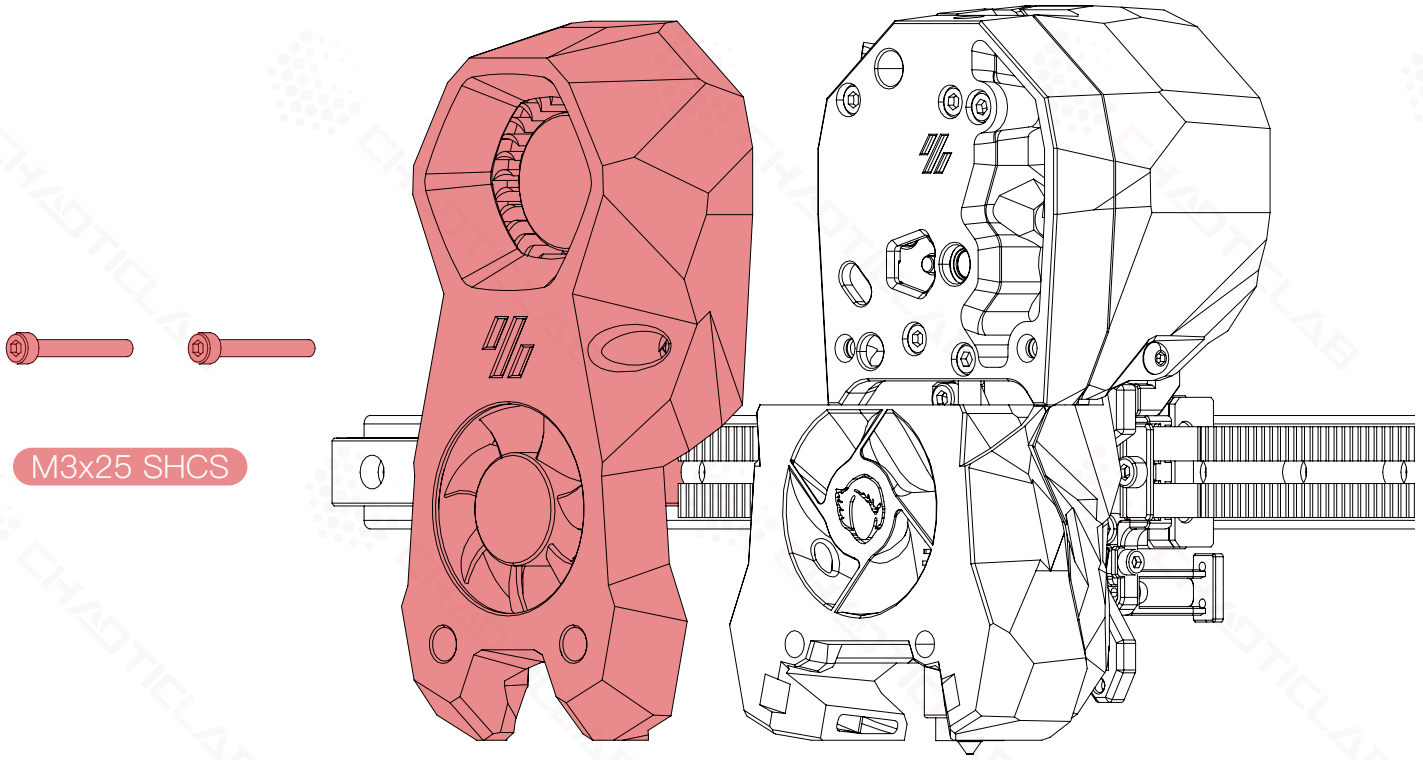
NOTE

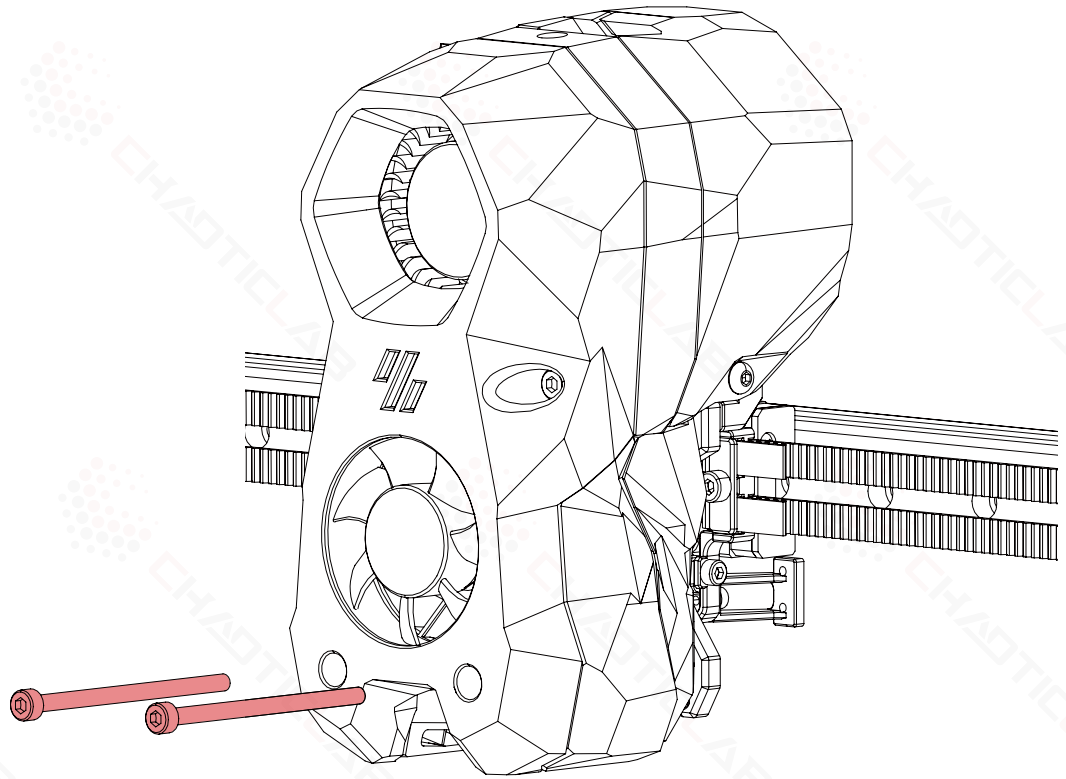
Because CNC machining is more precise than printed parts riveting copper nuts, if the tool head assembly is not installed in place, it will cause the subsequent screws to be unable to lock in. Therefore, before proceeding to the next step, please check whether the tool head assembly is already installed in place as shown in the figure.



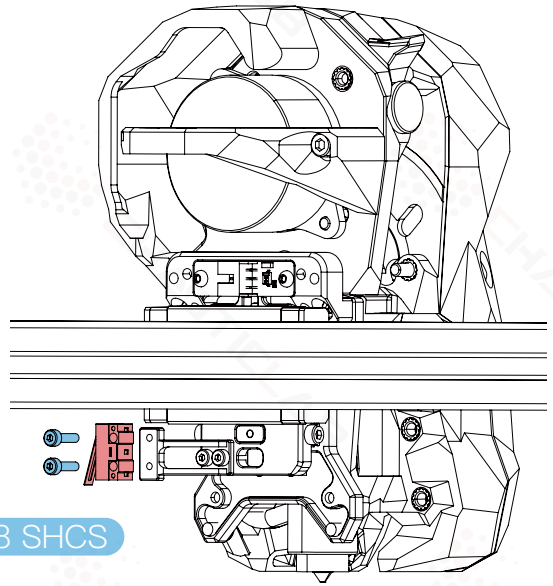


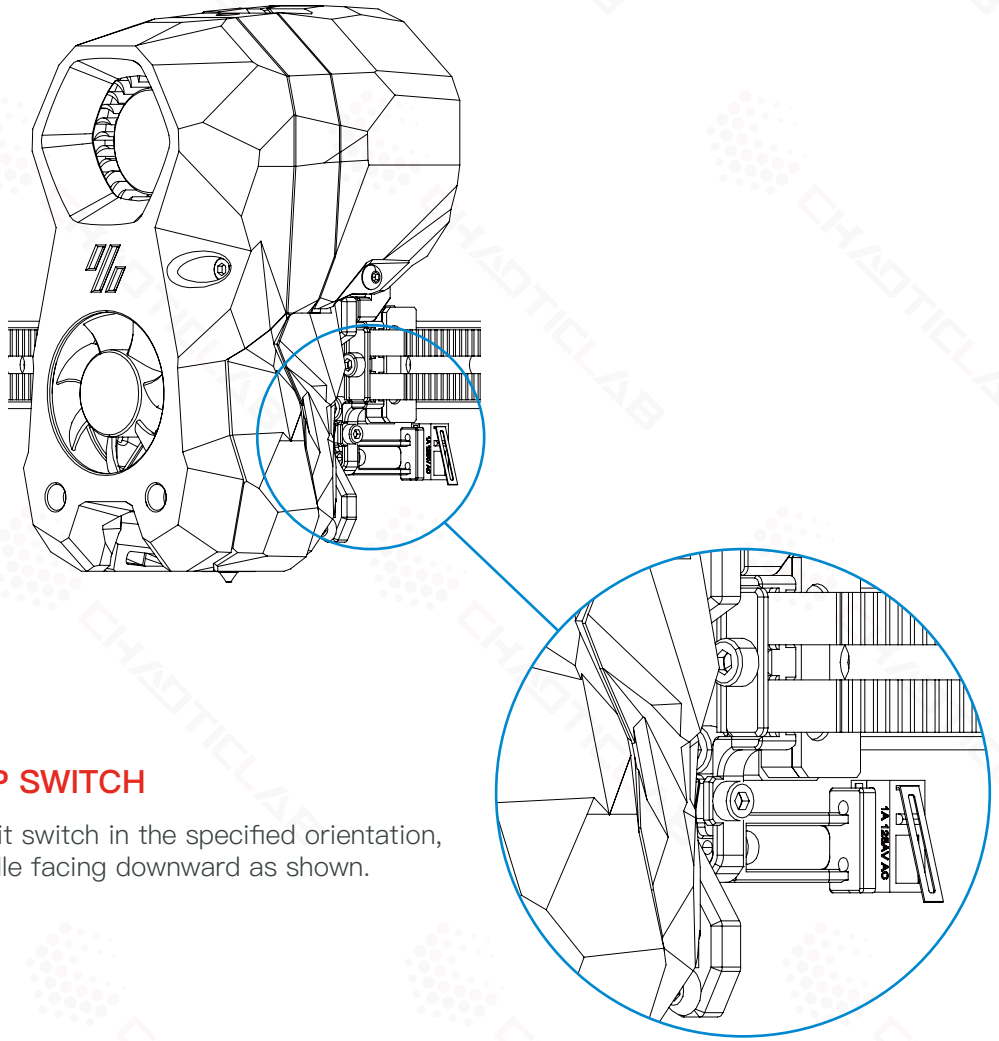

M3x10 SHCS


M3x25 SHCS



M3x50 SHCS



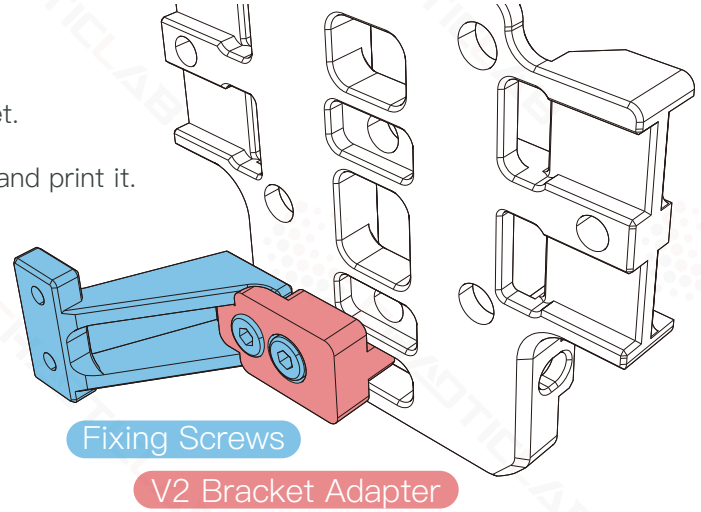


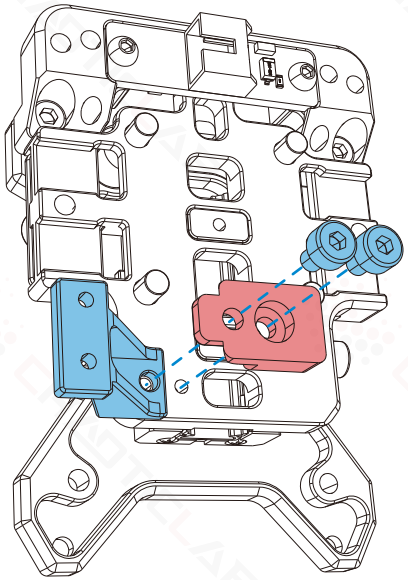
END-STOP SWITCH

Install the limit switch in the specified orientation, with the handle facing downward as shown.

V2 BRACKET ADAPTER

If using the CNC VORON TAP V2 on our Carbon Fiber Tube Kit for Voron2.4 X-Axis (300/350) ,
a V2 Bracket Adapter is required to adjust the mounting position of the X-axis limit switch bracket.
Please download the V2 Bracket Adapter model from
https://github.com/Chaoticlab/CNC-Tap-for-Voron/tree/master/STL/CNC_VORON_TAP_V2 and print it.



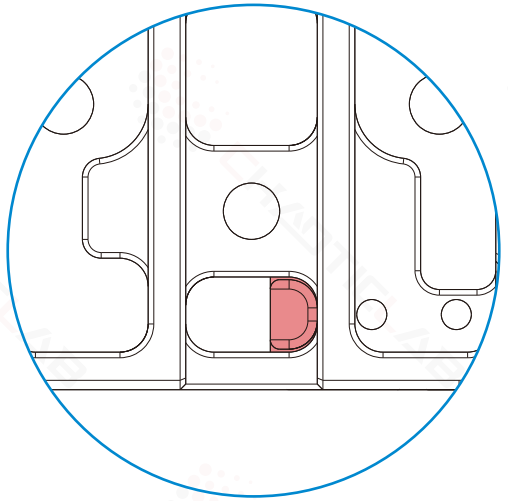


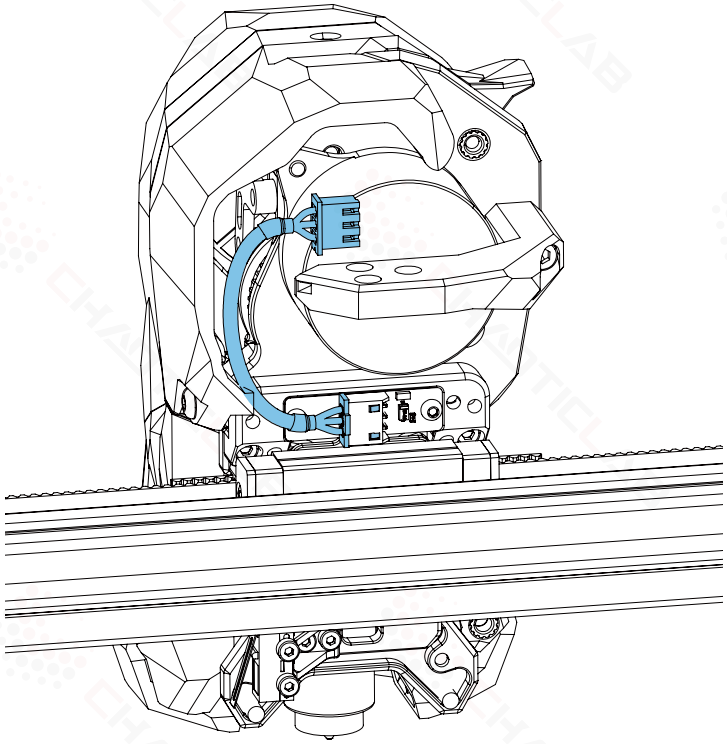
ALIGN TO SPECIFIED HOLES

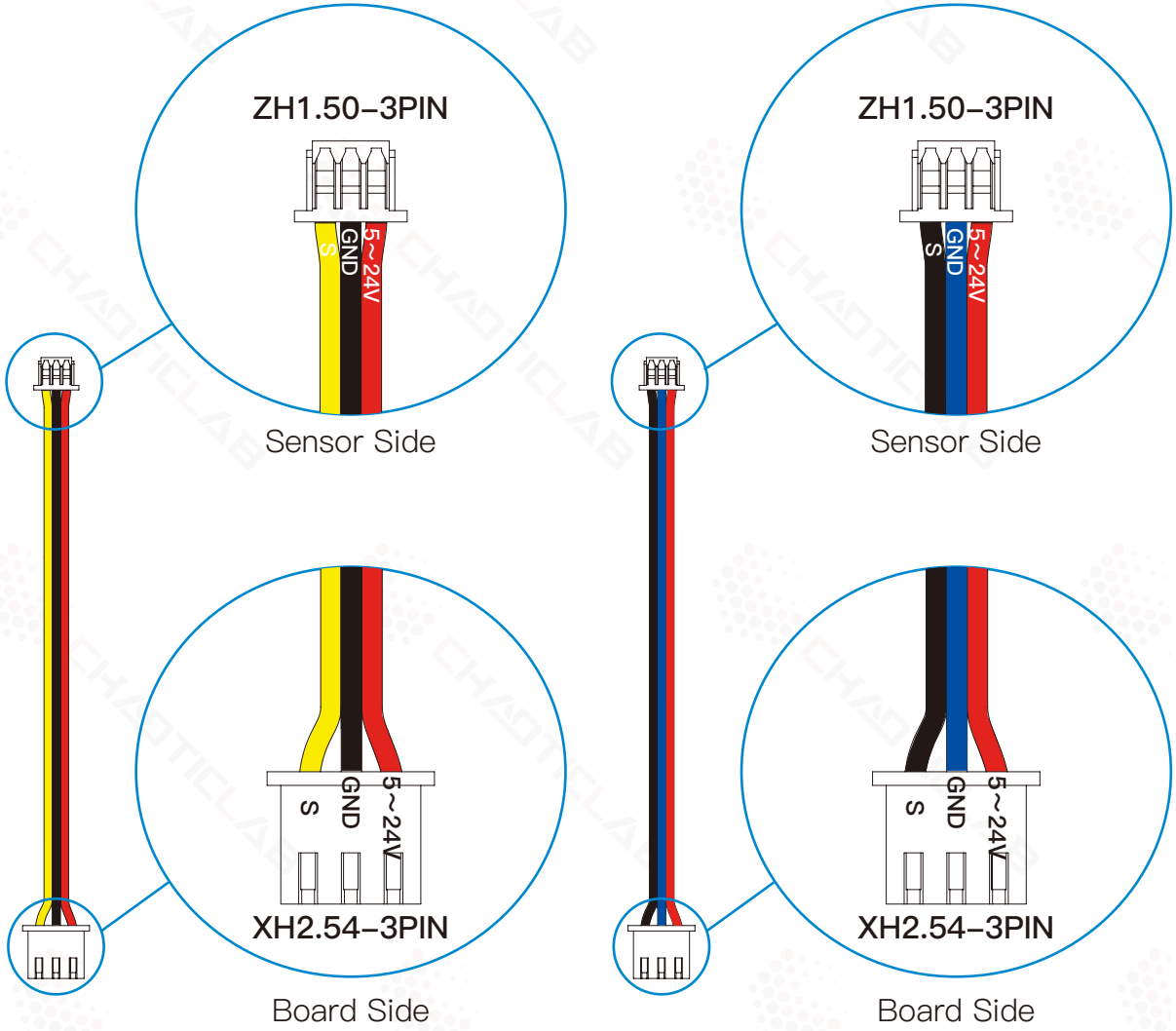
As indicated in the image, pass screws through the aligned mounting holes in the V2 Bracket Adapter, Limit Switch Bracket, and the CNC VORON TAP V2.

CHECK

The raised locator on the V2 Bracket Adapter should be flush against the left side of the cutout hole on the CNC VORON TAP V2.
For clear visualization, the image shows the opposite side with the V2 Bracket Adapter installed, so the locator step appears closer to the right side.



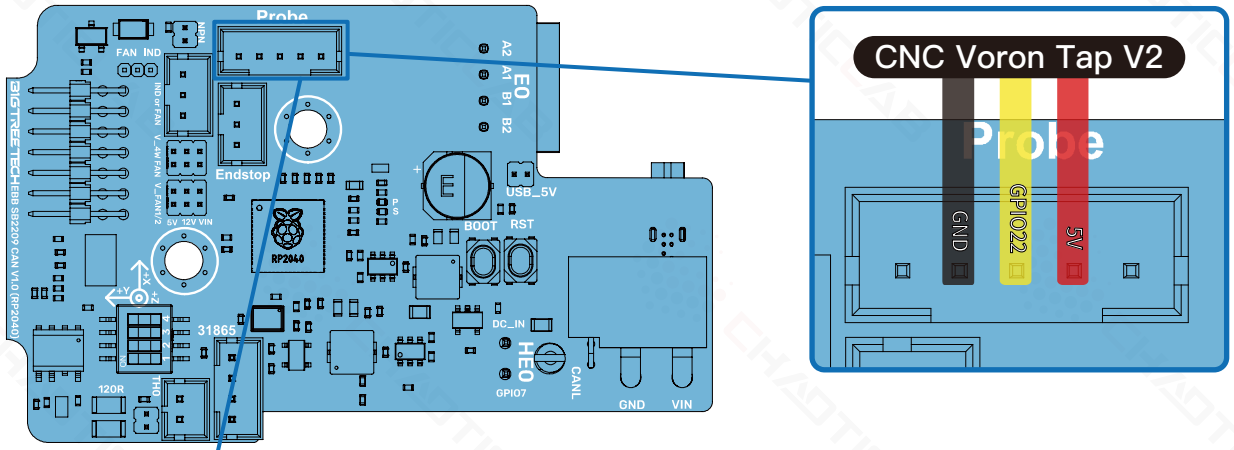




IMPORTANT

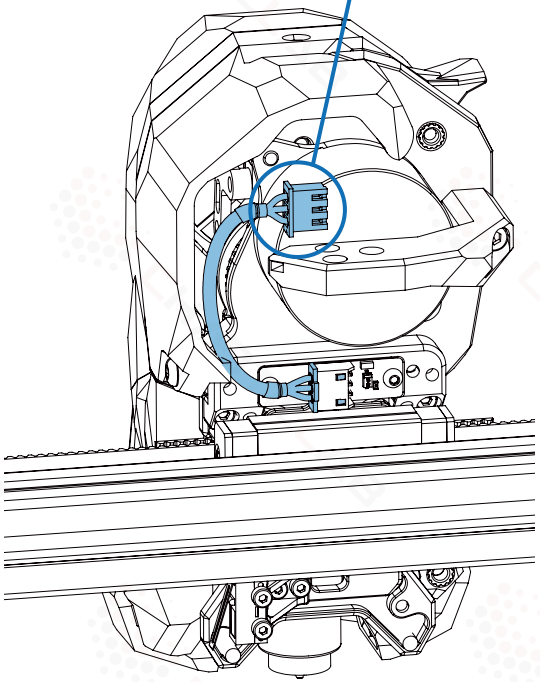
The CNC Voron Tap V2 can ship with two different wiring colours. Both wiring colour variants share the same electrical connection order even though the wire colours are different. With the Black/Blue/Red variant please be extra cautious not to confuse the signal and ground wires. Ground is usually a black wire but in this variant it is a blue wire with the signal being black. This variant is being phased out in order to avoid confusion.

If not using a tool board, please prepare a sufficiently long cable to match your machine.



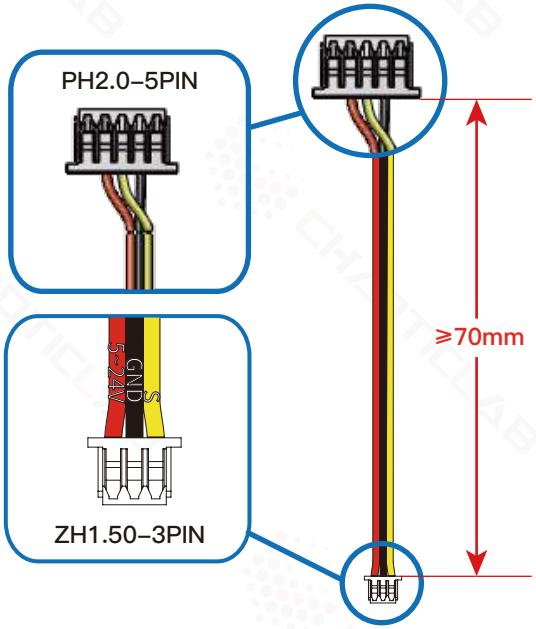
TIPS

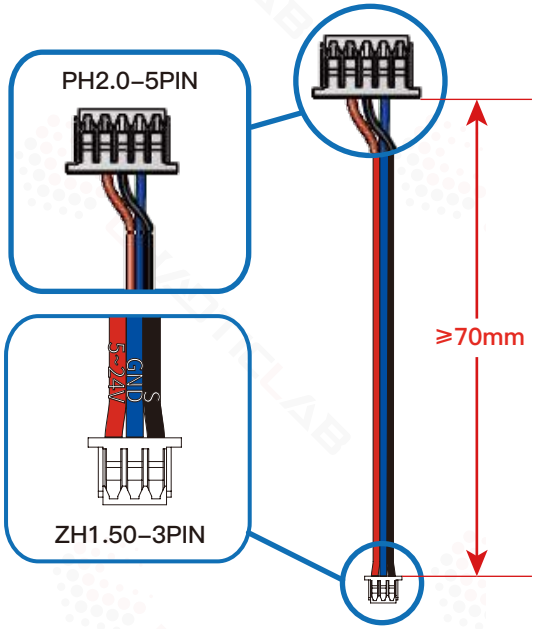
When using with the BIGTREETECH EBB SB2209 CAN (RP2040), the wire length should be at least 70mm. However, for ease of subsequent wiring and assembly, it is recommended that the wire length be ideally 100 mm or 110 mm.

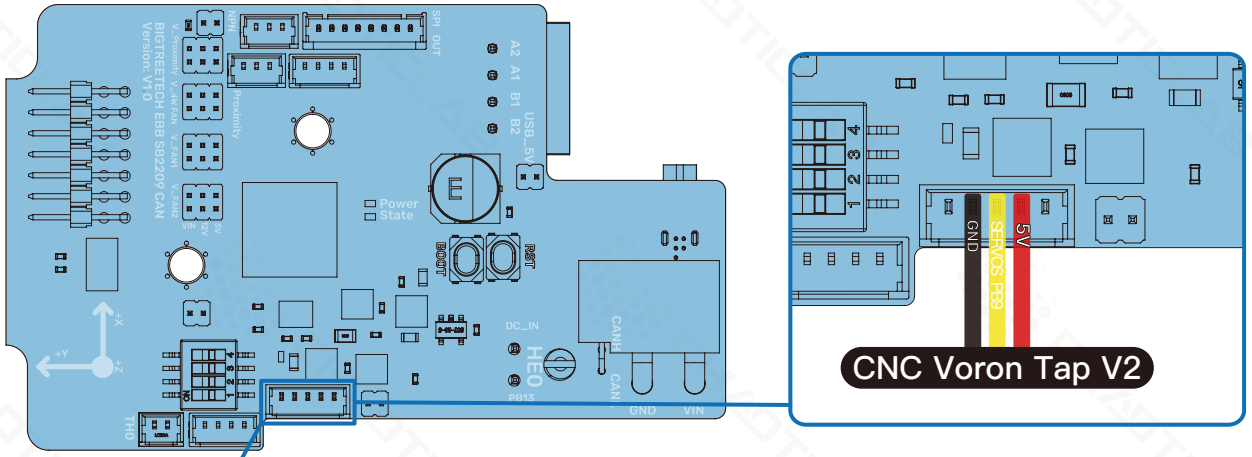


IMPORTANT

The CNC Voron Tap V2 operates on low voltage trigger and does not trigger on high level. When using the CNC Voron Tap V2 with the BIGTREETECH EBB SB2209 CAN(RP2040), connect it to the 5-pin port following the wiring diagram provided. The signal wire of the CNC Voron Tap V2 should be connected to the Servos signal wire, and the firmware should be set to pull down this signal pin to prevent the detection failure of the trigger signal due to signal wire breakage, which could result in the print head crashing into the heated bed.

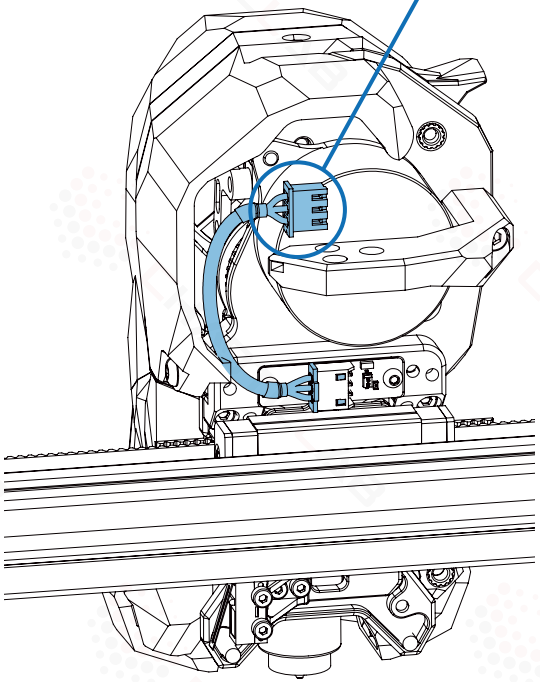






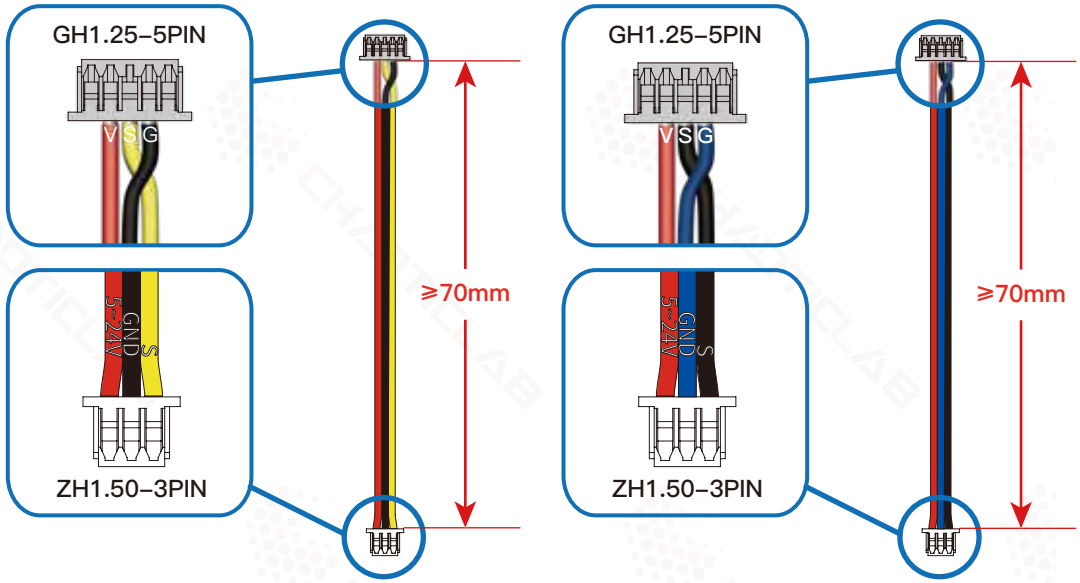
TIPS

When using with the BIGTREETECH EBB SB2240/2209 CAN, the wire length should be at least 70mm. However, for ease of subsequent wiring and assembly, it is recommended that the wire length be ideally 100 mm or 110 mm.



IMPORTANT

The CNC Voron Tap V2 operates on low voltage trigger and does not trigger on high level. When using the CNC Voron Tap V2 with the BIGTREETECH EBB SB2240/2209 CAN, connect it to the 5-pin port following the wiring diagram provided. The signal wire of the CNC Voron Tap V2 should be connected to the Servos signal wire, and the firmware should be set to pull down this signal pin to prevent the detection failure of the trigger signal due to signal wire breakage, which could result in the print head crashing into the heated bed.



There are two possible ways to connect the CNC VORON TAP V2. Both ways will provide a signal that indicates when the probe is triggered or not triggered but one way will also offer protection against the probe crashing into the bed in case of an accidental wire break. We therefore recommend this method but both methods are presented in case you have already used the needed pin for the preferred method.

PREFERRED METHOD:

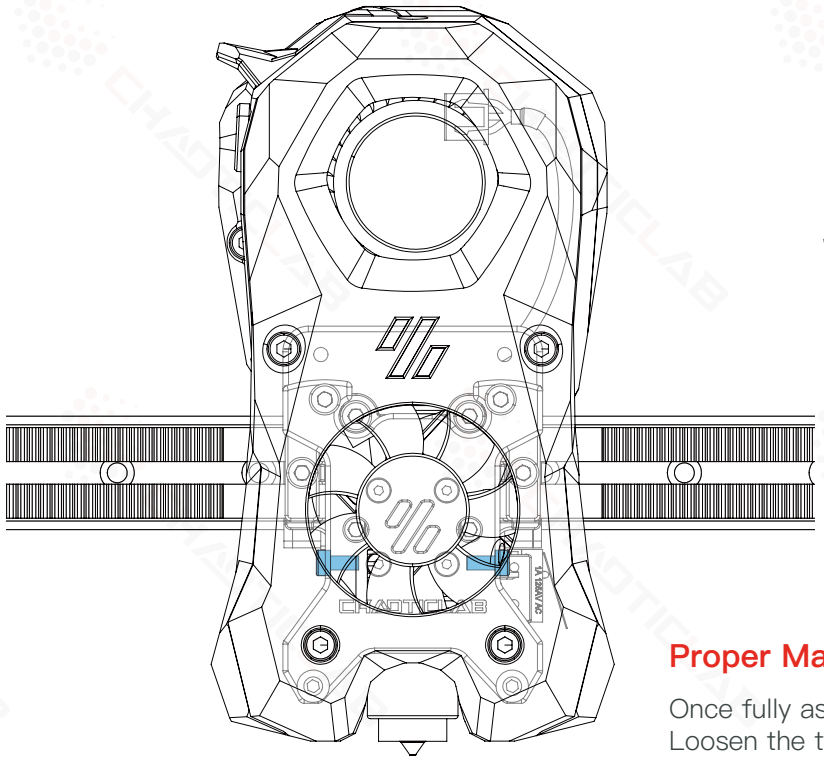
Wire the signal output from the CNC VORON TAP V2 to the 'SERVO' pin on the probe port of the EBB or motherboard. Configure the 'SERVO' pin to be pulled down in software. When the probe is stowed, the pin will be pulled high by the internal probe circuit. When the probe is triggered, the pin will be pulled low by the probe internal circuit. If a wire breaks, the pin will be pulled low by the internal pull down on the 'SERVO' pin.

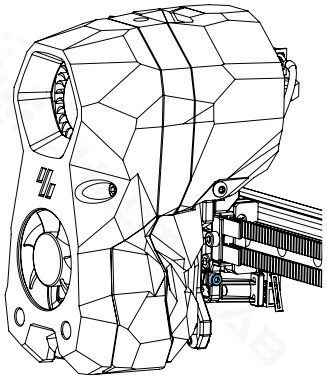
ALTERNATE METHOD:

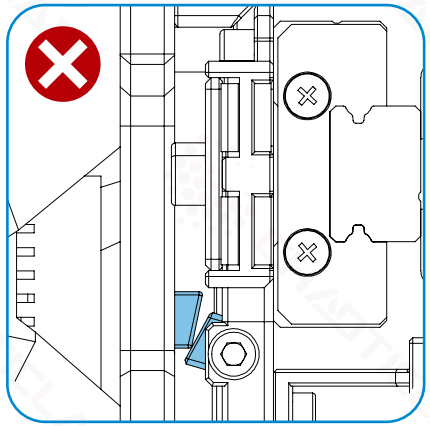
Wire the signal output from the CNC VORON TAP V2 to any input pin on the EBB or motherboard. These pins will mostly have pull up resistors implemented in hardware which means that the internal pull down resistor will not work. Configure the pin to be internally pulled up. When the probe is stowed it will be pulled high by the internal probe circuit and the internal MCU pull up. When the probe is triggered it will be pulled low by the internal probe circuit. If there is a wire break then the signal will continue to indicate that the probe is stowed and it becomes possible for the probe to crash into the bed.

WARNINGS:

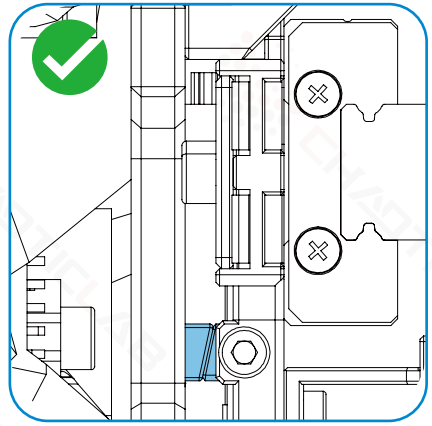
Once everything is set up, before starting to use, manually trigger the probe (by lifting the nozzle) and observe whether Klipper receives the correct signal. This is to prevent any damage due to wiring errors or improper configuration.







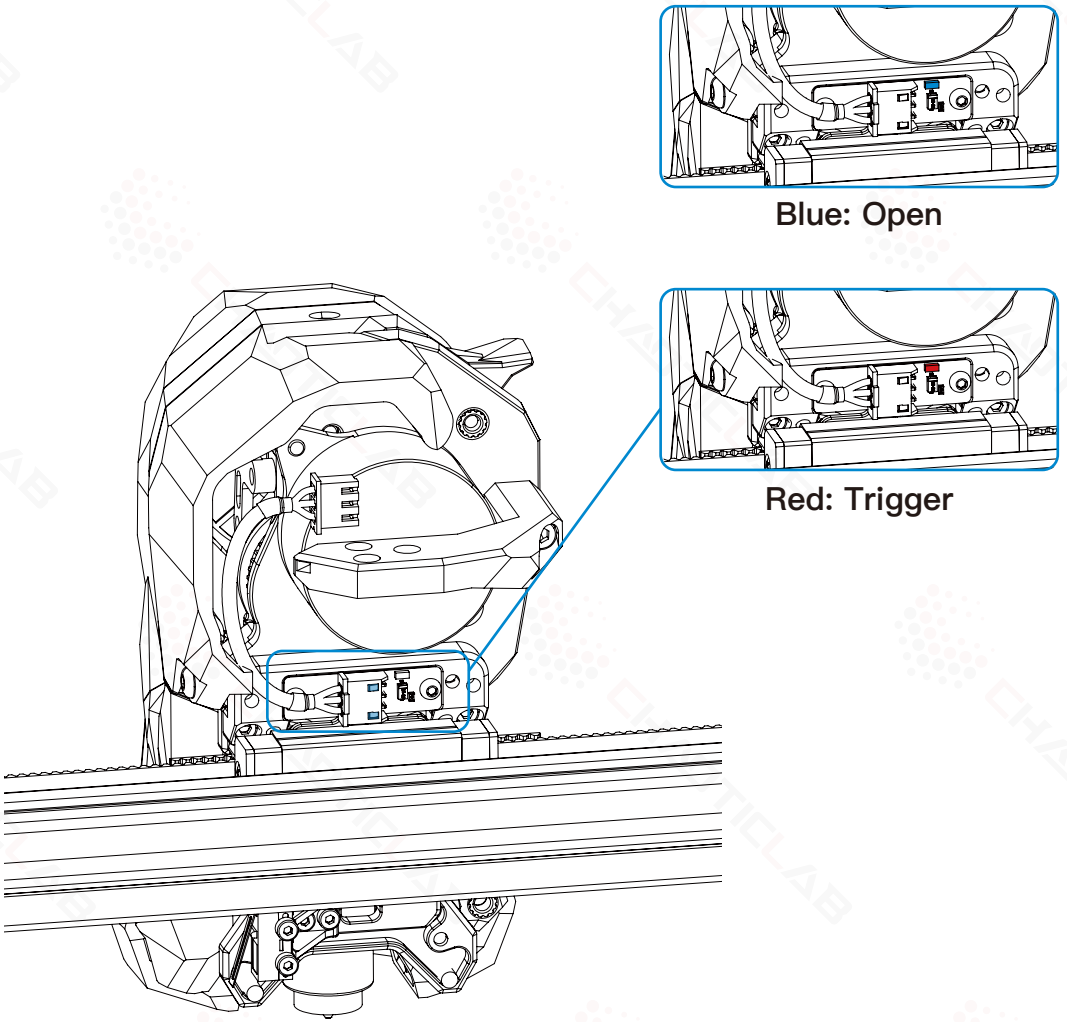
Wrong Position

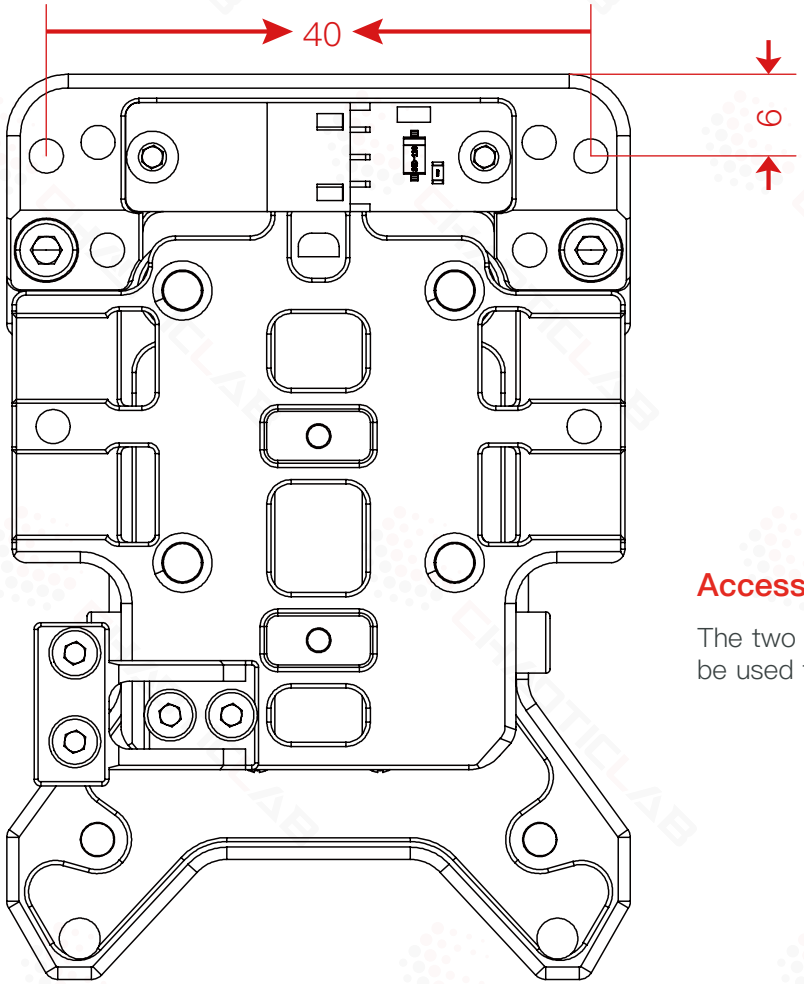


Correct Position

Proper Magnet Positioning

Once fully assembled, adjust the magnet assembly:
Loosen the two screws highlighted in the image,
Position the magnet in the correct orientation as shown.
Tighten the screws to secure the magnet assembly in place.


Blue: Open
Red: Trigger



Accessory Installation Holes

The two extra M3 screw holes on the back are reserved. They can be used to install a CAN bus cable bracket or other accessories.

CHAOTICLAB

Website
www.chaoticlab.xyz

GitHub
github.com/chaoticlab

Discord
discord.gg/uUCX666tk2