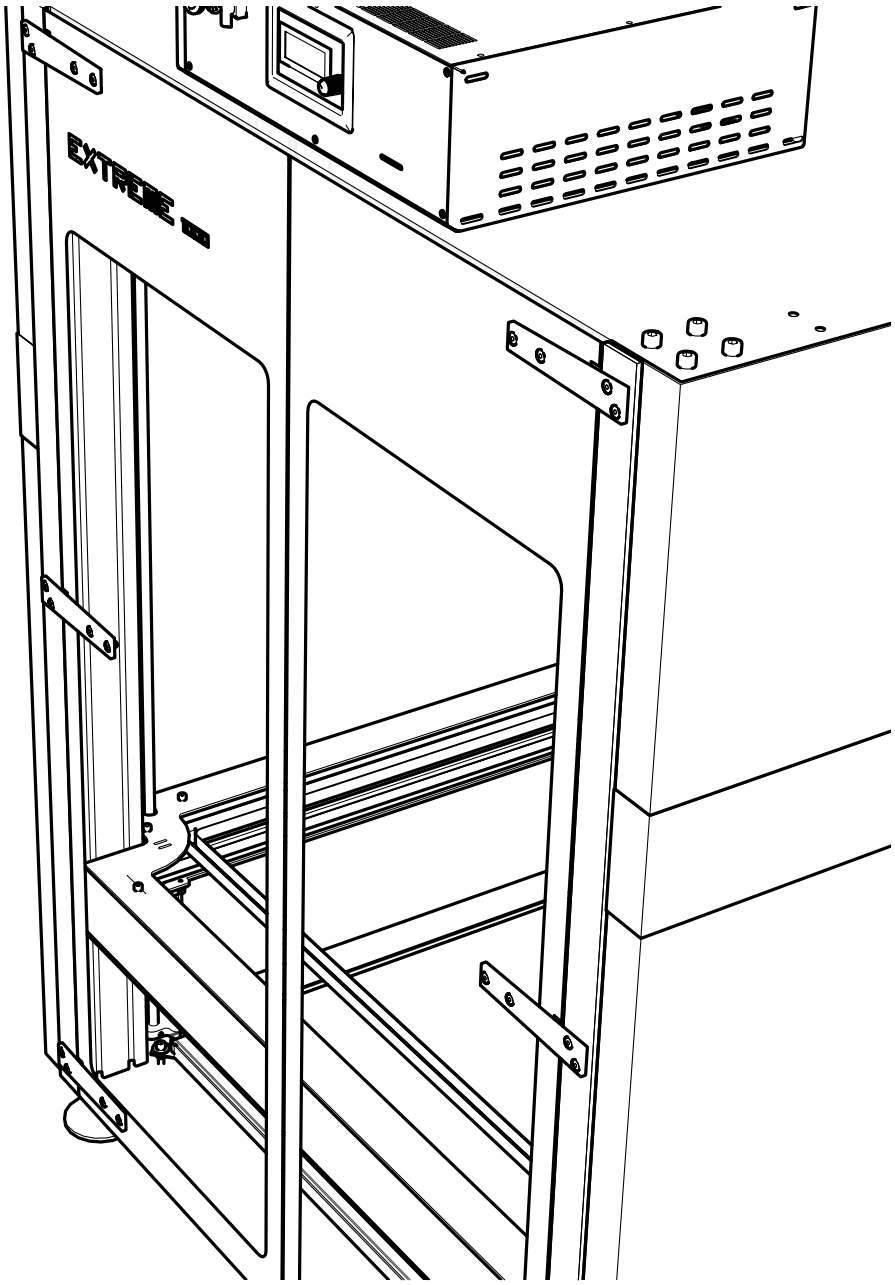
User Manual
Extreme



Introduction

This user manual is designed and allow you to easily and securely install and configure our product. Please read this manual carefully before installation, and use the printer according to these instructions. Store this manual for later reference.

Warranty

The Builder 3D printers Extruders are warranted only to the original purchaser for a period of three months from the original purchase date (when the Builder 3D Printers are used with the approved filament delivered by Builder 3D Printers, normal use and service and without opening the Builder 3D printer) against defective workmanship and material. The warranty of the extruder system will expire immediately when printing materials which are not delivered/recommended by Builder 3D Printers. All other parts are warrented for 1 year.

The warranty of the Builder 3D printer will expire when;

- the product is damaged
- neglect
- immersion in water
- abuse
- improper installation
- disassambled
- improper service

If you experience any problems with your Builder 3D printer please visit our YouTube channel which provides you with service videos that might solve the issue:http://www.youtube.com/user/builder3dprinters. When sending the Builder 3D printer back to our HQ please contact the helpdesk first. We need to diagnose the issues you experience first before taking any action. Contact helpdesk: helpdesk@builder3dprinters.com. If we are unable to solve the issue by phone or by using one of our YouTube videos we will inform you if the issue is a “warranty issue”.

Safety and compliance

WARNING

Pinch points. Do not reach inside when the machine is in operation.

WARNING

Hot surface. Risk of burns. Always allow the printer to cool down before touching the buildplate.

WARNING

Moving parts can crush and cut. Do not touch the belt when the machine is in operation.

WARNING

Machine starts and stops automatically. Do not reach inside the machine after initiating a program.

WARNING

Breathing fumes may be hazardous to your health. Machine cannot protect from fumes.

WARNING

Hot surface. Risk of burns. Always allow the printerhead to cool down before servicing.

DANGER

Hazardous voltage. Risk of electric shock. Always unplug the printer before doing maintenance.

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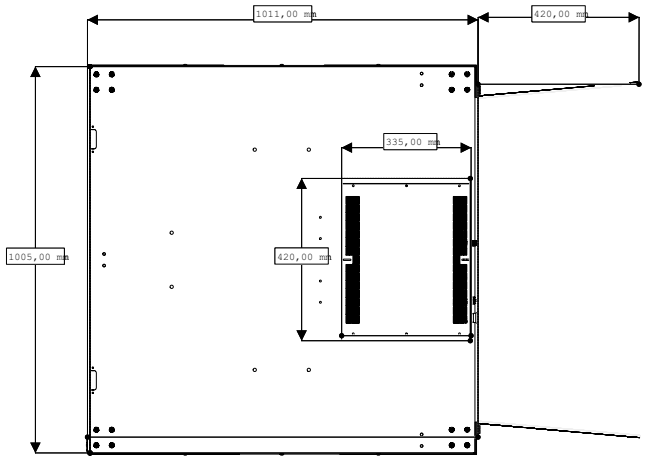
Overview
Specification printer

Printing		Printer	
Print technology:	FDM / FFF	Dimensions printer (LxWxH):	Extreme 1000: 1006x1016x 1500 Extreme 2000: 1175x1016x 2300
Build volume (LxWxH):	Extreme 1000: 700x700x820 mm Extreme 1500: 1100x515x820mm Extreme 2000: 700x700x1820 mm	Weight:	Extreme 1000: 220kg Extreme 1500: 200kg Extreme 2000: 250kg
Resolution:	Low quality : 0.6 mm Normal quality: 0.4 mm High quality: 0.2 mm	Frame:	Aluminium profiles
Print speed:	Extreme 1000: < 80 mm/s Extreme 1500: < 80 mm/s Extreme 2000: < 80 mm/s	Print platform:	Heated glass plate
Travel speed:	Extreme 1000: < 200 mm/s Extreme 1500: < 200 mm/s Extreme 2000: < 200 mm/s	Certification:	CE certified
Position accuracy stepper:	X: 10 micron Y: 12,5 micron Z: 2,5 micron		
Nozzle diameter:	0,4 - 0,8 - 1,2 mm	Temperature	
Filament diameter:	1,75 mm	Operating temp printer:	15 - 32° C
Operating temp nozzle:	180 - 250° C	Storage temp printer:	0 - 35° C
Electronics		Software	
AC input:	100 - 240 V 50/60Hz	Software:	Simplify3D, Cura
Power consumption:	800 -1800W	Operating systems:	Windows, MAC
Connections:	WiFi, Stand alone from SD card	Colormix software:	Only for Windows
		File types:	STL / OBJ / AMF / DAE

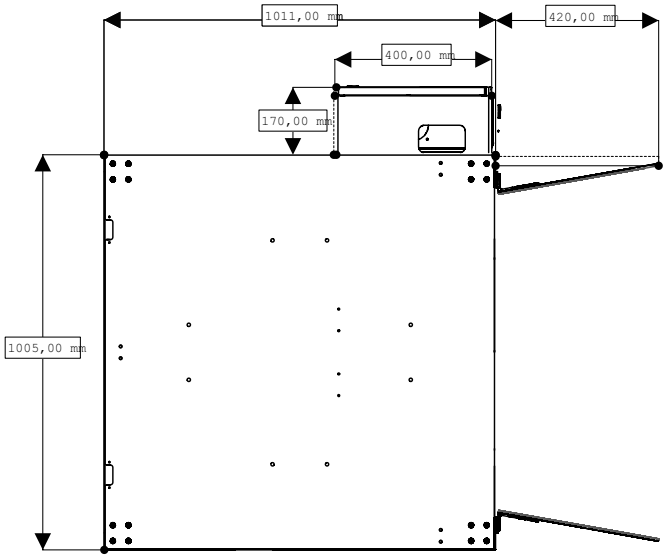
Subject can be changed:

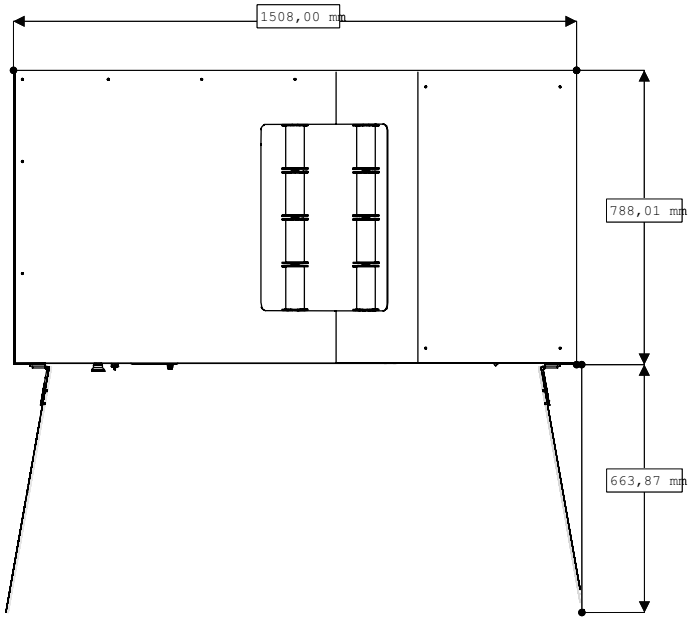
Overview
Outside dimensions

Extreme 1000

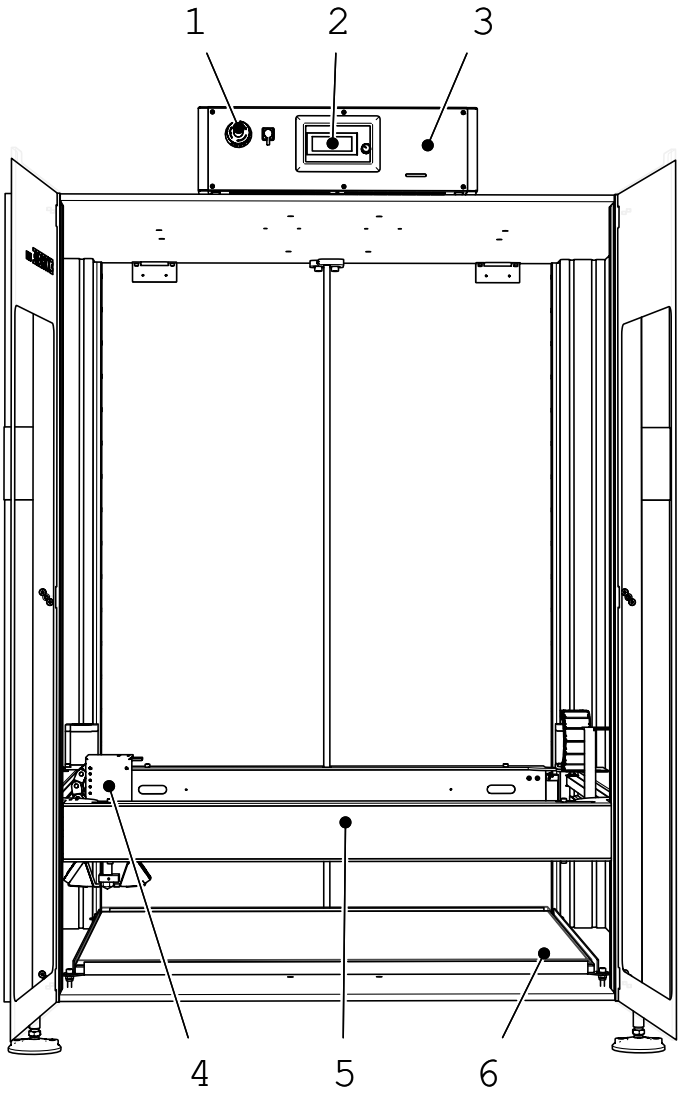


Extreme 2000



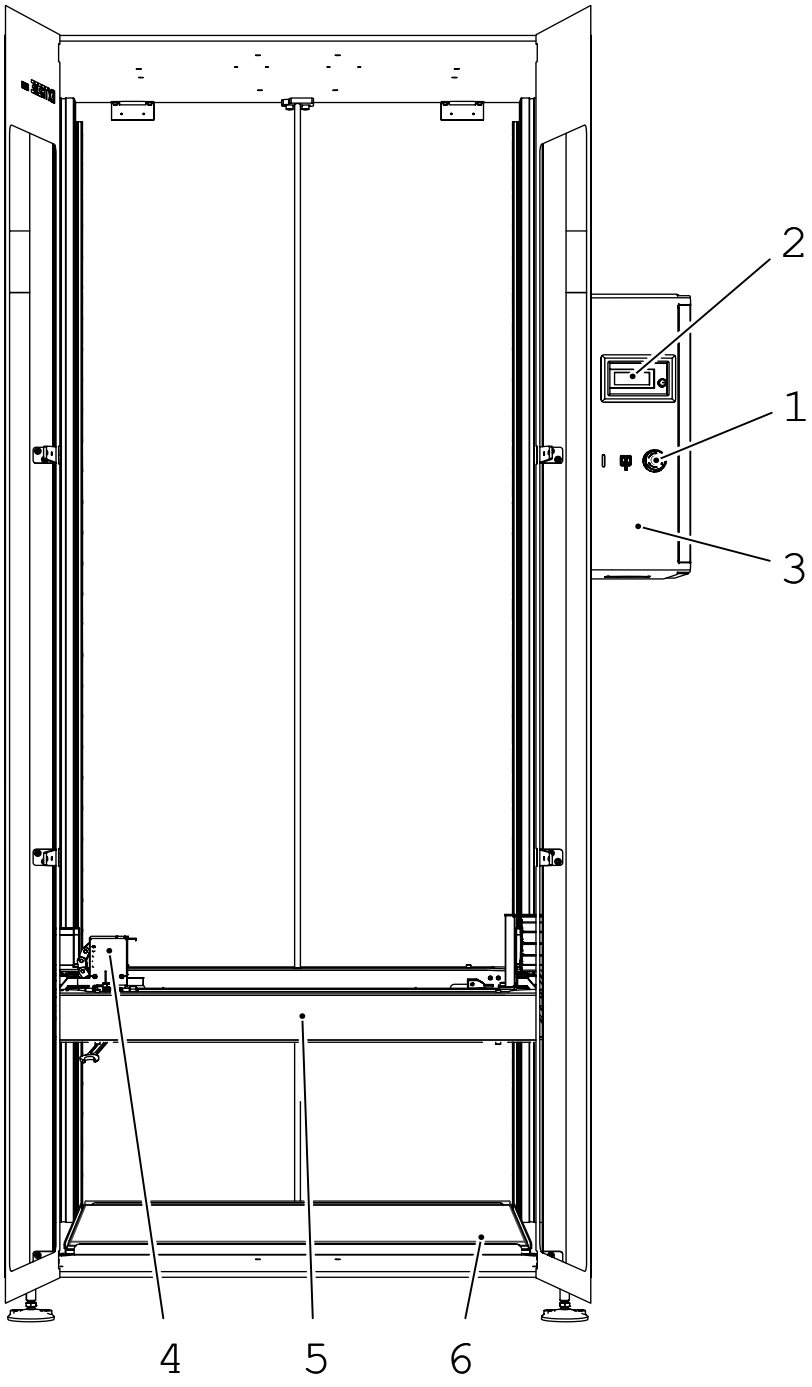


Overview
Extreme 1000



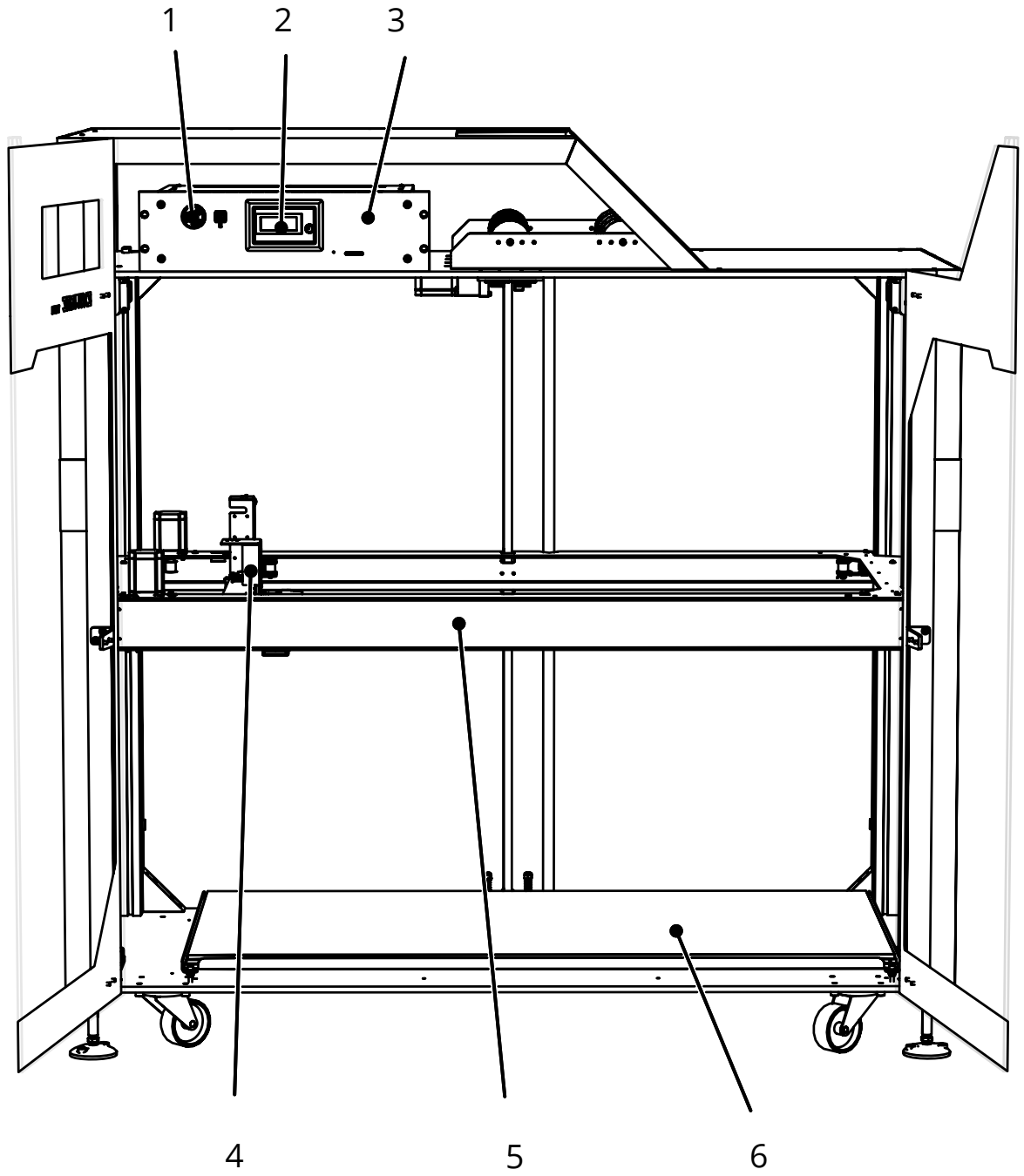
1. Emergency stop
2. LCD display
3. Control Box
4. Printhead
5. Print frame
6. Heated bed

Overview
Extreme 2000



1. Emergency stop
2. LCD display
3. Control Box
4. Printhead
5. Print frame
6. Heated bed

Overview
Extreme 1500



1. Emergency stop
2. LCD display
3. Control Box
4. Printhead
5. Print frame
6. Heated bed

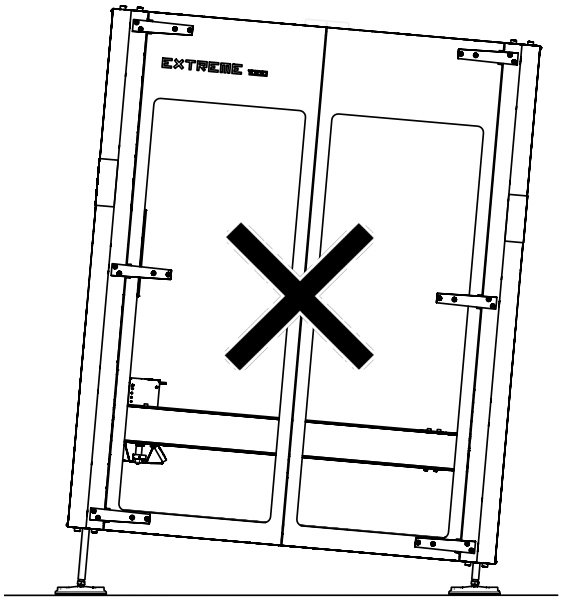
Installation printer

Installation

Levelling the printer is important for making good quality prints.

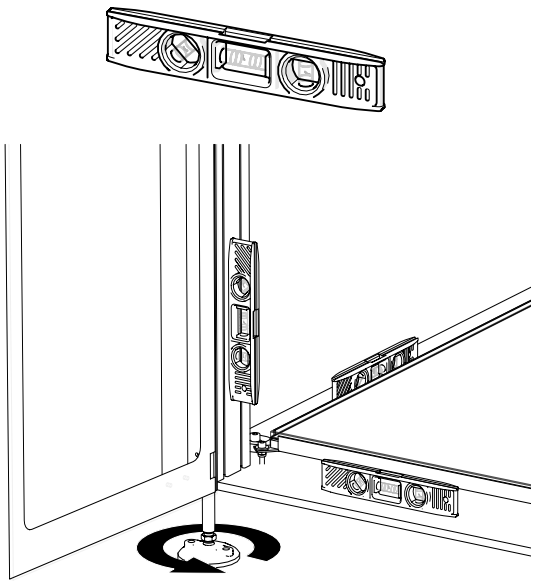
1. Level printer

Place the printer on a concrete floor and check if the printers is level



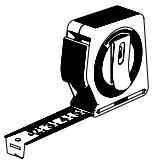
2. Spirit level

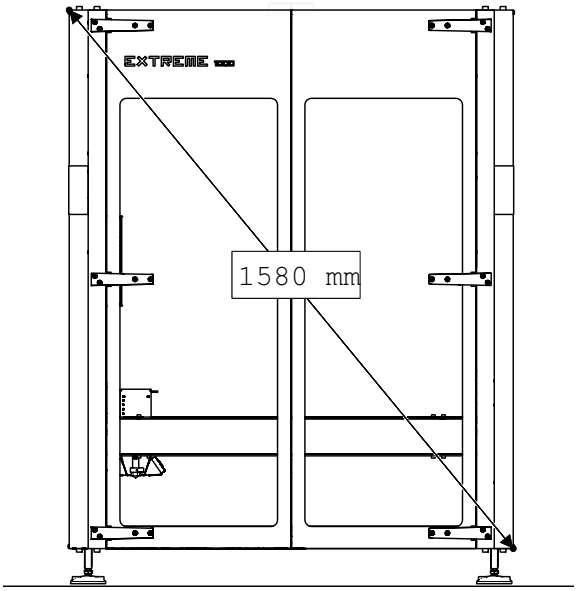
Level the printer with the included spirit level. Check all the three axis as shown. Be sure al the three axis are levelled if not use a wrench to move up or down the machine feet to get the machine level



3. Measure

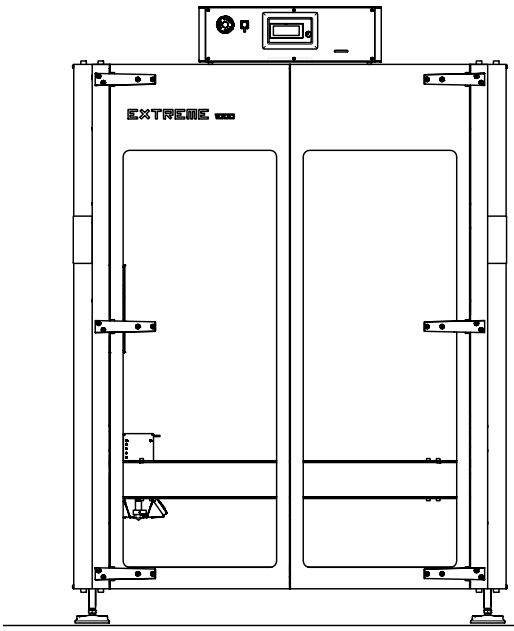
Measure both diagonals of the printer and make sure the lenghts are the same. Should be around 1580 mm. For the Extreme 2000 the length should be around 2437 mm.





4. Placing control box

When the printer is leveled correctly, place the controlbox on top of the printer.

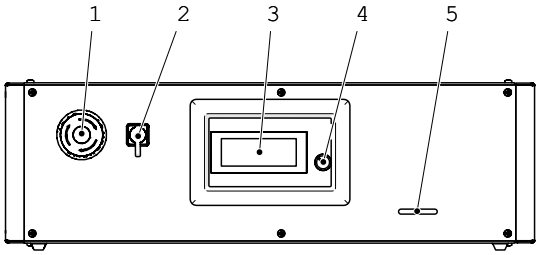


Control Box
Layout

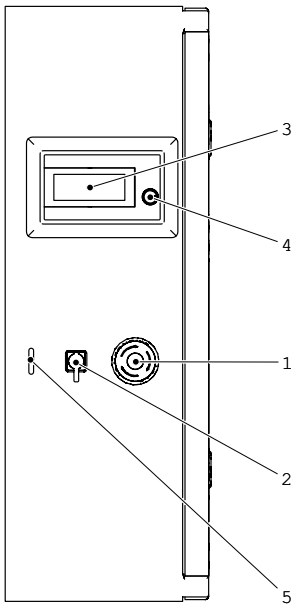
Control Box
Connect all the cables to the controlbox and switch on the printer with the on / off switch at the back of the controlbox

1. Emergency stop
2. Light switch
3. LCD screen
4. LCD control button
5. SD card slot

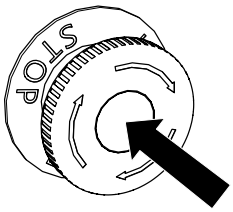
Extreme 1000 Control Box



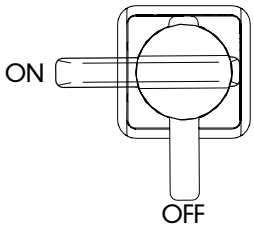
Extreme 2000 Control Box



Emergency stop
Push the emergency stop in case of an emergency situation the printer shuts off the power. Rotate the emergency stop to deactivate.

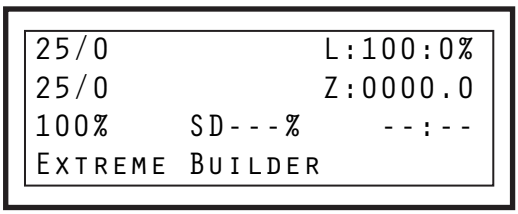


Light switch
Rotate the light switch to switch on and off the LED light during (night) printing.

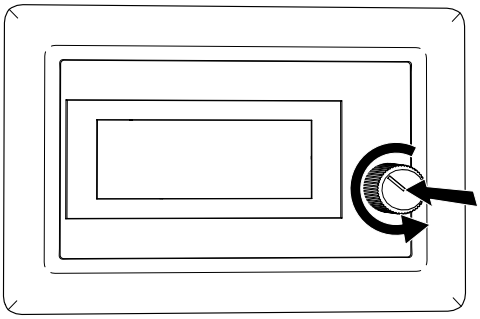


LCD Sceen
The display provides information about the printer and object as shown in the image.

1. Line one tells you the hotend temperature/ target temperature and the (L) extruder ratio. When the extruder ratio is 60 % the left extruder is feeding 60% and the right extruder 40% material at the same time.
2. Line two shows you the heated bed temperature/target temperature and the Z height of the print head.
3. In line three you can find the feedrate of the printing progress, SD card progress and the printing time.



LCD control button
Rotate/Push the LCD control button to control the LCD screen.

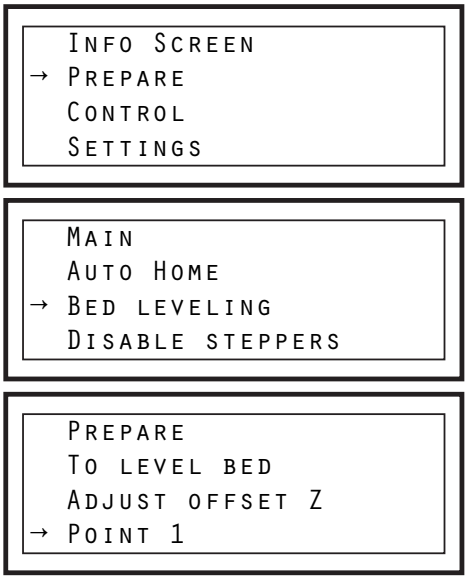


SD Card slot
Insert the SD Card upside down into the SD card slot. Push the SD Card to eject. On the SD card you can find some printer ready Gcodes.

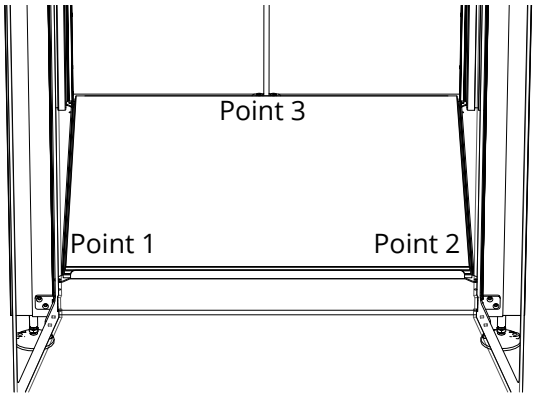
LCD Screen
Bed leveling

Bed leveling

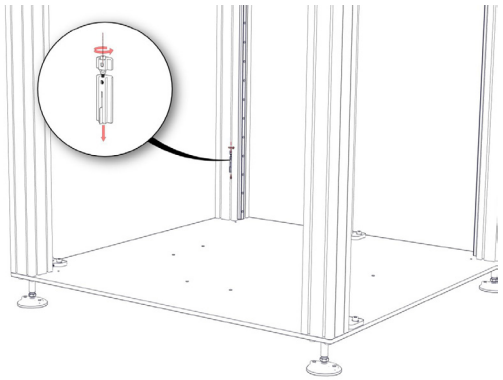
Follow the next steps to level the print head. Use a screwdriver and a piece of paper for the calibration.



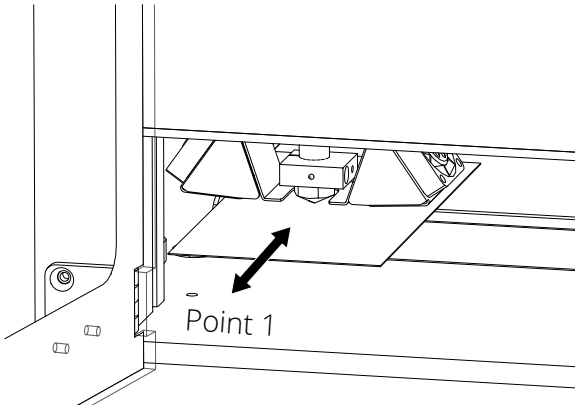
The head will now move to point 1 on the bed surface and start to level the frame



When the head and the frame is no longer move, then you should be able to slide a folded piece of paper (0.2mm) between the head and the bed.



If there is not enough clearance the folded paper will not fit. Then you will have to adjust the endstops triggers in the left front column upwards

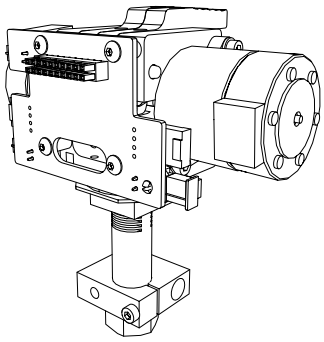


If there is more than enough clearance the folded paper will fit very loosely then you will have to adjust the endstop trigger in the left front column downwards.

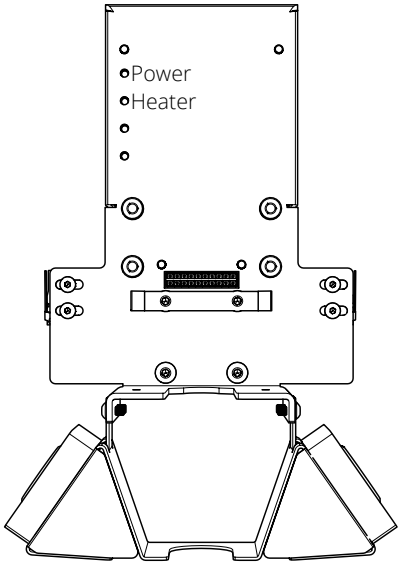
When the folded paper fits some what tightly, then you can move on to point 2 and 3.

Printhead
Installing Printhead

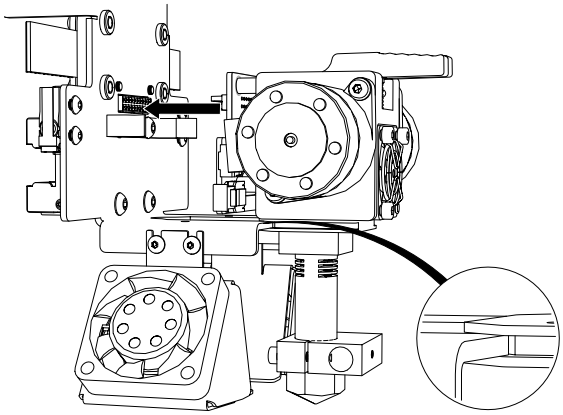
Printhead
For easy maintaining it is possible to remove the printhead from the printhead frame.



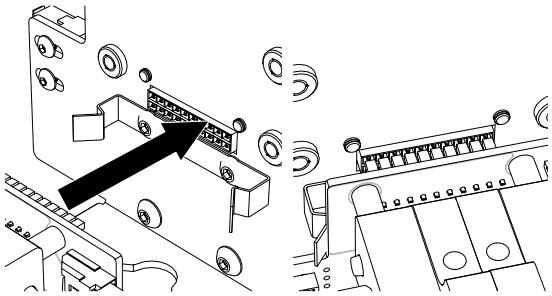
When placing the printhead be sure the power is switched off. Check power light on the printhead frame



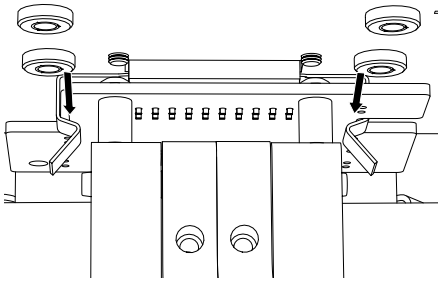
Placing printhead
Slide the printhead onto the printhead frame.



Be sure the connectors are alligned in front of eachother. Push the printhead untill the connect



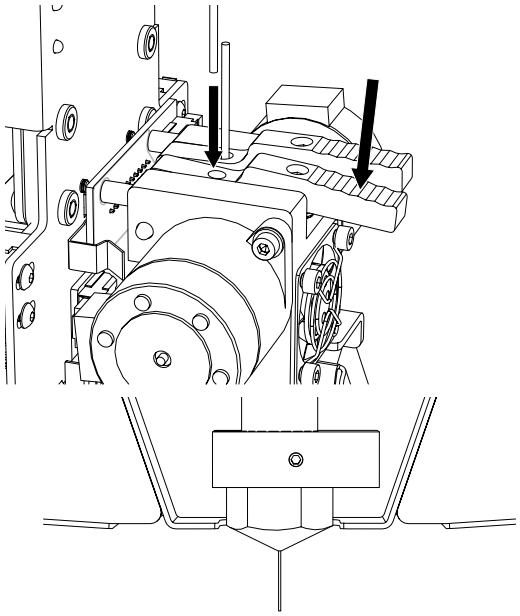
Check if the clips are snapped into place



Inserting filament
Push down the button and insert the filament until you feel some resistance. Now insert the second filament by doing the same. Keep pushing the buttons, then push down the filament until it comes out of the nozzle. Do this with both filaments.

⚠ WARNING

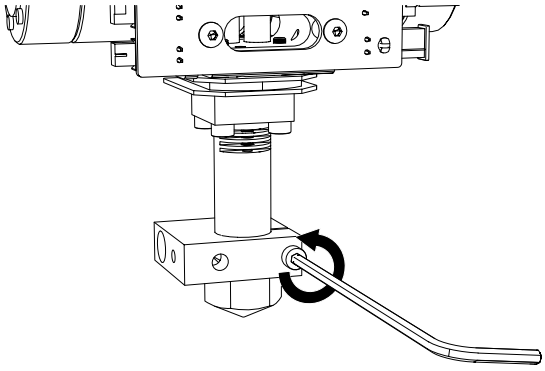
Make sure when priting with the Dual-Feed both extruder holes are filled with a filament.



Printhead
Changing nozzle

Changing nozzle

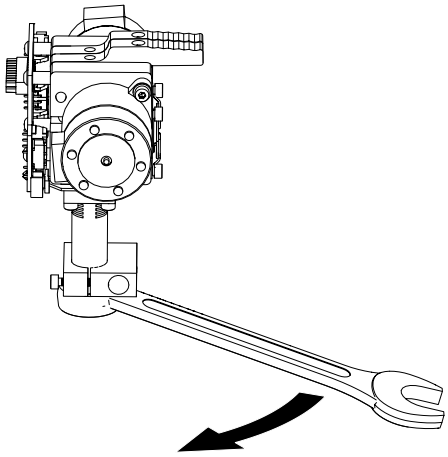
Wait untill the printhead is cooled down. Take the printhead out of the printer and loosen the heaterblock.

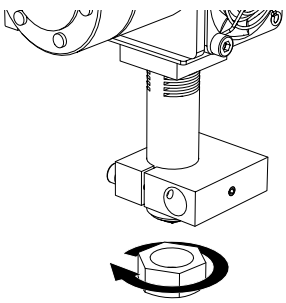


Remove the nozzle using a 17mm wrench or the included tool. If the nozzle is stuck, place the extruder in the machine and heat up the hotend. When it's reached a temp of 210 degrees Celsius switch off the printer and take out the extruder to remove the nozzle

⚠ WARNING

The extruder is hot when heating up the hotend for easy removement.

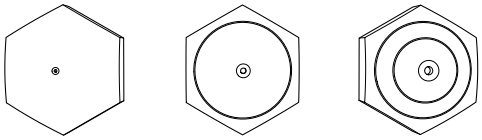




When installing the nozzle make sure you don't tighten the nozzle too much.

Nozzle diameters

The nozzles are marked on the top of the nozzle.



0.4 mm 0.8 mm 1.2 mm

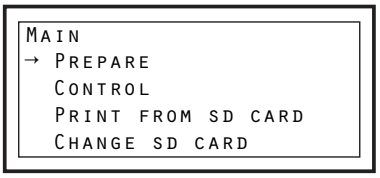
When using nozzles 0.8 and 1.2 mm be aware the extrusion speed needs to be very high. To avoid under extrusion tighten the pressure screws in the levers.

First layer height

The first layer height depends on the size of the nozzle. Here are a few examples for the diferent nozzle sizes:

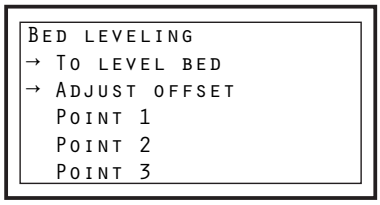
Nozzle 0.4 mm	First layer 0.3 mm
Nozzle 0.8 mm	First layer 0.4 mm
Nozzle 1.2 mm	First layer 0.6 mm

LCD Screen **Layout**

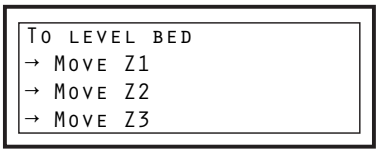


Prepare: Menu to prepare printer for printing
Control: Menu to change speed, temp and extruder ratio
Print from SD card: Choose gcode file from SD card
Change SD card: Select when inserting SD card

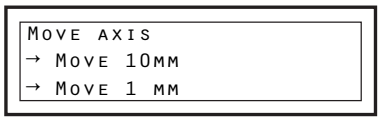
Auto home: Moves printhead to his home position
Bed Leveling: Menu for level the nozzle relative to bed
Dissable steppers: Shuts off all the stepper motors
Preheat: Preheat bed (60) and nozzle (220)
Cooldown: Shuts off bed and nozzle to cooldown
Move axis: Menu for moving printhead and extruder



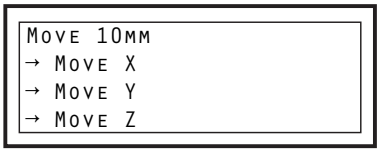
To level bed:
Adjust offset: Create an offset between nozzle and bed
Point 1: Move to calibration point 1
Point 2: Move to calibration point 2
Point 3: Move to calibration point 3



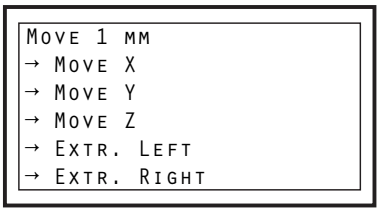
Move Z1: Move Z motor 1 up and down
Move Z2: Move Z motor 2 up and down
Move Z3: Move Z motor 3 up and down



Move 10 mm: Move X,Y and Z axis in steps of 10 mm
Move 1 mm: Move X, Y, Z axis and extruders 1mm

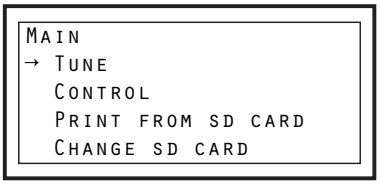


Move X: Move the X axis in steps of 10 mm
Move Y: Move the Y axis in steps of 10 mm
Move Z: Move the Z axis in steps of 10 mm

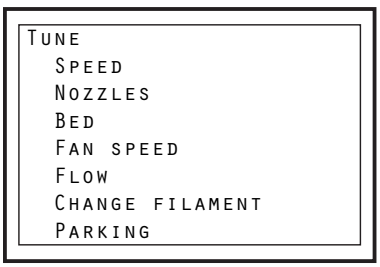


Move X: Move the X axis in steps of 1 mm
Move Y: Move the Y axis in steps of 1 mm
Move Z: Move the Z axis in steps of 1 mm
Extr. Left: Move the left extruder in steps of 1 mm
Extr. Right: Move the right extruder in steps of 1 mm

Info screen while printing

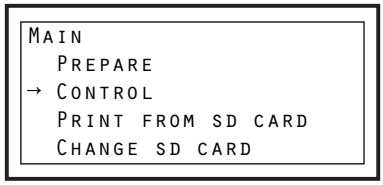


Tune: Menu to tweak the print while printing
Control: Menu to change speed, temp and extruder ratio
Print from SD card: Choose gcode file from SD card
Change SD card: Select when inserting SD card

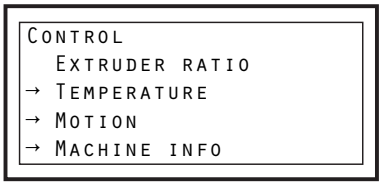


Speed: Change printspeed
Nozzles: Change the printing temperature
Bed: Change the bed temperature
Fan speed: Change the fan speed
Flow: Change the flow of the material
Change filament: Pauses the print for changing filament
Parking: Pauses the printer and move to his park position

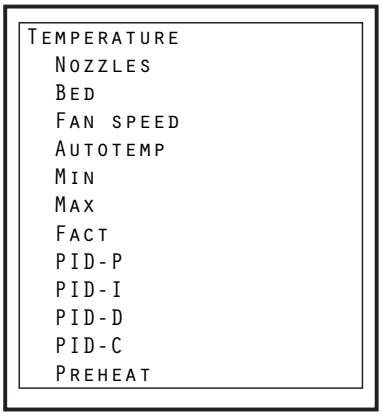
LCD Screen
Layout



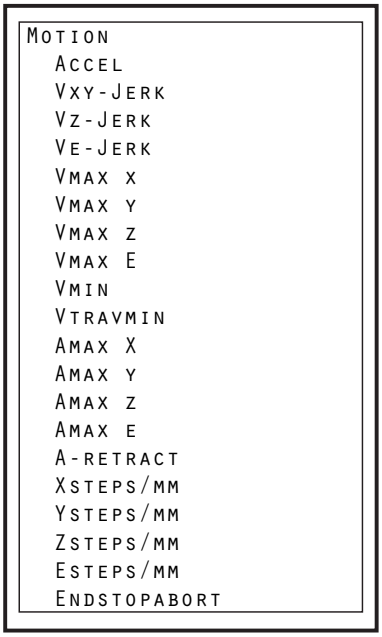
Prepare: Menu to prepare printer for printing
Control: Menu to change speed, temp and extruder ratio
Print from SD card: Choose gcode file from SD card
Change SD card: Select when inserting SD card



Extruder ratio: Choose percentage of the extruder
Temperature: Menu for changing temperature
Motion: Menu for changing motion related values
Machine info: Menu for factory reset and firmware version



Nozzles: Change nozzle temperature
Bed: Change Bed temperature
Fan speed: Change fan speed
Autotemp: If enabled right temperature will calculated
Min: Minimum temperature if autotemp is enabled
Max: Max temperature if autotemp is enabled
Fact: Factor multiplied by maximum feedrate.
PID-P: Extruder Potential Coefficient
PID-I: Extruder Intergral Coefficient
PID-D: Extruder Differential Coefficient
PID-C: Heating power = Kc + e_speed, default = 1
Preheat: Menu for changing the preheat values

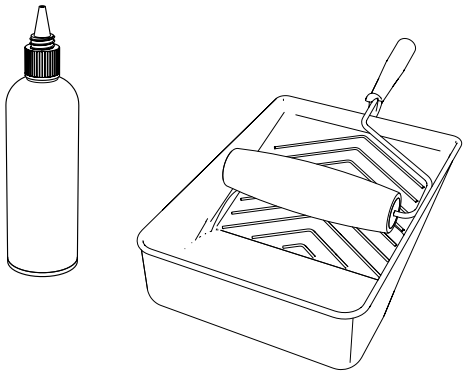


Accel: Absolute ceiling acceleration for all axis
Vxy-Jerk: Limits the change in acceleration over time for x,y
Vz-Jerk: Limits the change in acceleration over time for z
Ve-Jerk: Limits the change in acceleration over time for e
Vmax X: Maximum X axis velocity
Vmax Y: Maximum Y axis velocity
Vmax Z: Maximum Z axis velocity
Vmax E: Maximum extruder velocity
Vmin: Minimum velocity
Vtravmin: Minimum travel velocity
Amax X: Maximum X acceleration
Amax Y: Maximum Y acceleration
Amax Z: Maximum Z acceleration
Amax e: Maximum extruder acceleration
A-retract: Maximum retract acceleration
Xsteps/mm: Amount of steps for moving 1mm
Ysteps/mm: Amount of steps for moving 1mm
Zsteps/mm: Amount of steps for moving 1mm
Esteps/mm: Amount of steps for moving 1mm
Endstopabort: Off, Dont stop if hit endstop while printing

Firmware: Check the firmware version of the printer
Factory reset: settings to original system state

Print platform
Adhesion layer

Adhesion layer
The adhesion layer Builder recommends is woodglue/water mixed



Preheat
Heat up the machine before applying an adhesion layer to the bed. Select preheat in the menu to heat up the printhead and bed.

Add adhesion layer
If the bed has reached his temperature, wait a few minutes. After a few minutes shut down the printer and apply the adhesion layer to the heated bed. Move up the printhead/ frame for easy access.