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## **Kossel Mini 3D Printer Safety Guidelines**

### ABOUT

Welcome, new user! Kossel is a parametric delta robot 3D printer, built in 2012 by Johann C. Rocholl, father of deltabot printers. It is semi self-replicating and named after Albrecht Kossel, a German biochemist and pioneer in the study of genetics.

The Kossel Mini design has three arms, each attached to an independent, stepper-driven vertical axis, which results in a simpler machine with a smaller footprint and faster positioning than other printers. In deltabots, as opposed to a Cartesian printer, linear motion is generated by three drive towers, so the print head can move equally fast in the x-, y- and z-axis, with fewer moving parts (think rectangle v. triangle). A Bowden extruder keeps the head light and balanced. Best of all it has an auto-leveling probe that hops around the build platform, which is always entertaining to watch.

The prints are made with PLA filament.

### SPECIFICATIONS

Type: Delta printer

Speed: 320 mm/s in all 3 directions.

Resolution: 100 steps/mm in all 3 directions.

Repeatability: better than 0.03 mm (30 micron)

Build volume: cylindrical, 170mm diameter, 240mm height.

Footprint: triangle, 300 mm width (240mm OpenBeam + printed corners).

Frame height: 600 mm.

Print surface: unheated round glass, doesn't move.

Mass of end effector with Hotend: less than 50 grams.

Simplicity: fewer than 200 parts.


Fully automatic print surface level calibration (Auto-Leveling)

## SAFETY GUIDELINES

1. Please carefully read all the instructions before attempting to operate the 3D printer.
2. **NEVER** operate or test the 3D printer without proper ventilation in the area
3. **NEVER** touch the hot end of the printer. It is usually around 200°C and will cause severe burns.

## PRECAUTIONS

1. **DO NOT** make *any* modifications to the Kossel Mini or safety features of the Kossel Mini. Doing so is strictly prohibited.
2. **DO NOT** attempt to use any other type of filament or print material other than what is provided by the staff.
3. **DO NOT** place hand or any other body part in the print area.
4. **AVOID** breathing near the hot end where the plastic is being melted.

 Use of controls or adjustments or performance of procedures other than those specified herein may result in severe burn.

## ELECTRICAL SAFETY

1. If the Kossel Mini needs to be adjusted or serviced, please alert staff member immediately. **NEVER** attempt to make adjustments yourself or open the electronics cabinet without staff supervision. You could seriously injure yourself and the machine.
2. The Kossel Mini is sensitive to electrostatic discharge. Make sure you don't have a static charge on you before touching any electrical component of the printer. Touch a grounded object before operating or attempting any adjustments.
3. If opening Kossel Mini cabinet for service, ensure that the power supply is turned 'off' and the cord is disconnected.

## IMPORTANT TIPS

1. Do not attempt to change material color in the middle of an active print session. Doing so may damage the Kossel Mini.
2. Avoid touching any component of the printer in order to achieve the best quality print. Don't touch the print head during auto-leveling. Doing so will

cause an inaccurate reading and can cause the probe to tear the tape on the platform. Also be careful not to bump the extruder or filament spool as it could cause the plastic to deposit unevenly.

3. Keep this printer cool. If you suspect the printer is overheating, please alert the staff immediately.