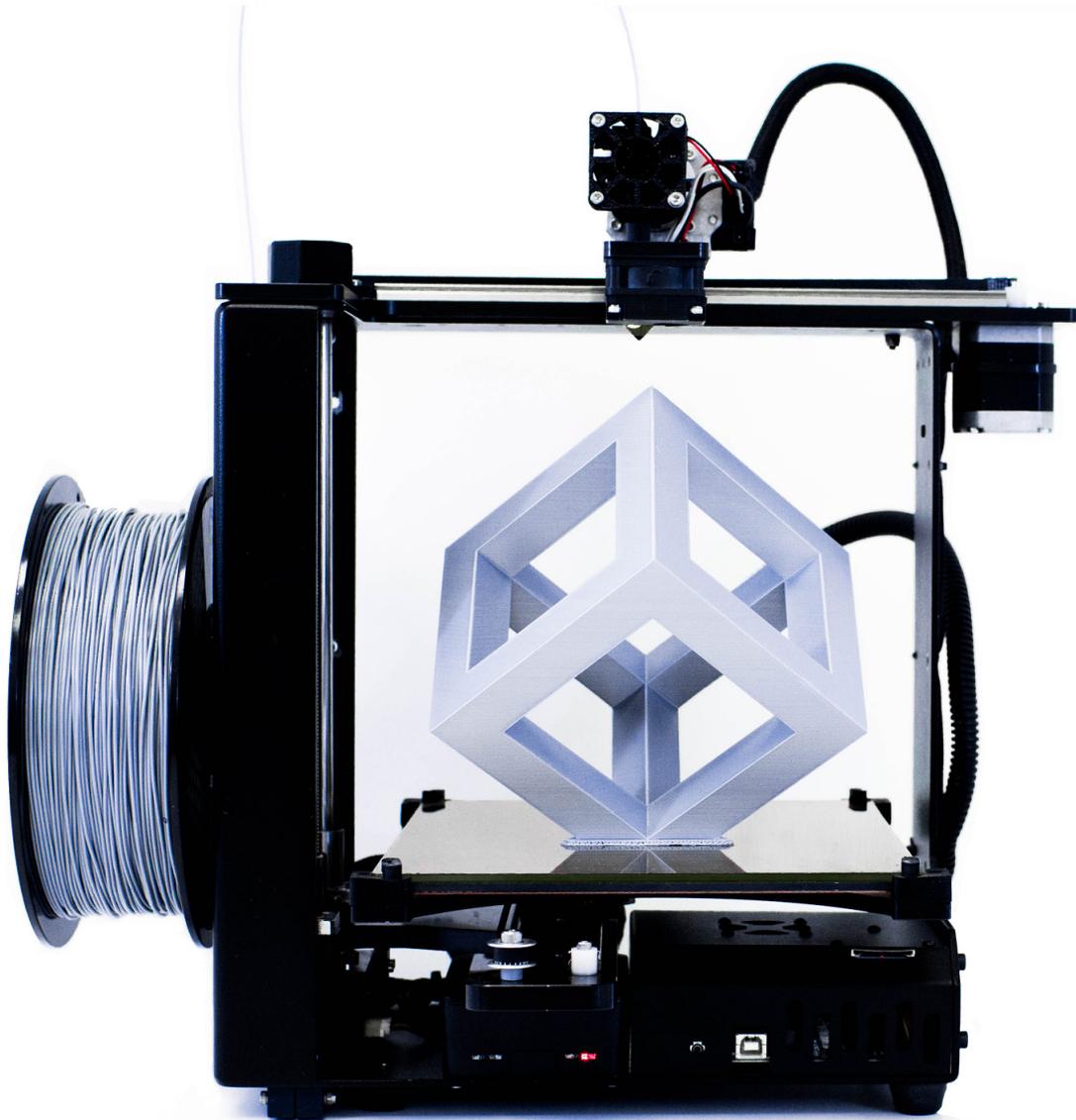




# USER GUIDE



**MAKERGEAR**

**M3** Single   
Extrusion

# Contents



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# Welcome



## Your MakerGear M3-SE 3D Printer has arrived!

Following minimal setup, your M3-SE is ready to print out-of-the-box. To ensure safety as well as high quality printing, carefully follow the setup instructions included in this User Guide.

This printer was assembled at the MakerGear shop in Beachwood, Ohio, USA, and was tested for at least six hours to ensure that it was fully operational at the time of shipping.



Do not remove the film of yellow polyimide tape from the M3-SE's glass build plate; this functions as the print surface, and should be facing up.



Do not change the M3-SE's firmware unless you know exactly what you're doing or have been instructed to do so by MakerGear support.

This User Guide can also be found on the MakerGear website at [setup.makergear.com](https://setup.makergear.com), where you can access additional, more specific information and resources.



# Important Safeguards



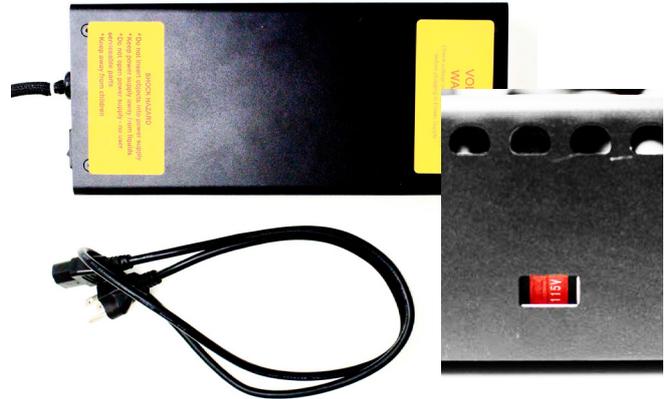
1. The following safeguards exist to ensure the safety of users and to avoid potential risks. Ignoring these safeguards can cause damage to the printer and its environment.
2. Unplug the power cord when the printer is not in use. To unplug, grasp the plug and firmly pull it from power outlet. You should never
3. To protect against electrical shock, do not put the printer body, cord, or electrical plug in liquid. If the printer falls into liquid, do not touch it. Instead, unplug the printer from power outlet, then remove it immediately. Do not reach into the liquid without unplugging the
4. This printer should not be used by children unless supervised by an adult who understands the risks and precautions involved in its use. To avoid potential injuries, close supervision is necessary when the printer is used by or near children.
5. Avoid any contact with moving parts. The printer can move quickly, so stay clear to avoid being struck or pinched.
6. Keep hands/hair/clothing away from printer attachments while the printer is operating to reduce risk of injury to persons and/or damage to
7. Do not operate the printer if it has a damaged cord/plug, is malfunctioning, or has been dropped or damaged in any way. If you are having any problems with the printer (such as temperature errors, unexplained shutdowns, or other erratic behavior), unplug the printer from power outlet and contact support. Do not operate a
8. Keep area around the printer clear. The heated build platform moves horizontally and vertically and may cause the printer to move or damage other equipment if it strikes them.



# What's Included



Power supply and cord. If your power supply has a voltage switch as shown to the right, ensure that it is set to the correct voltage.



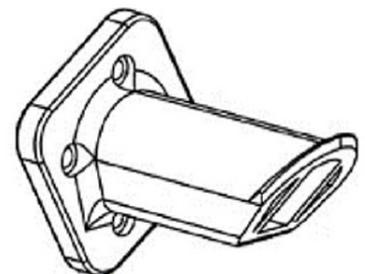
Tool kit: hex drivers, tweezers, filament guide tube, feeler gauge, brush, and 4 extra glass build plate hold-down clips.



1 kg spool of 1.75 mm black PLA (color may vary).

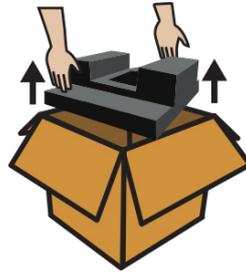


Spool holder with screws and sample container, both of which were printed on an M3.

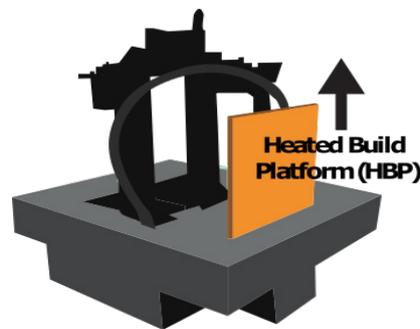




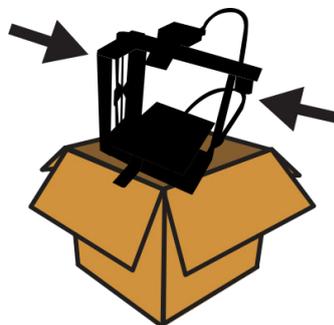
# Hardware Setup



1. Carefully compress and remove the foam from the top of the printer and from inside the printer frame.

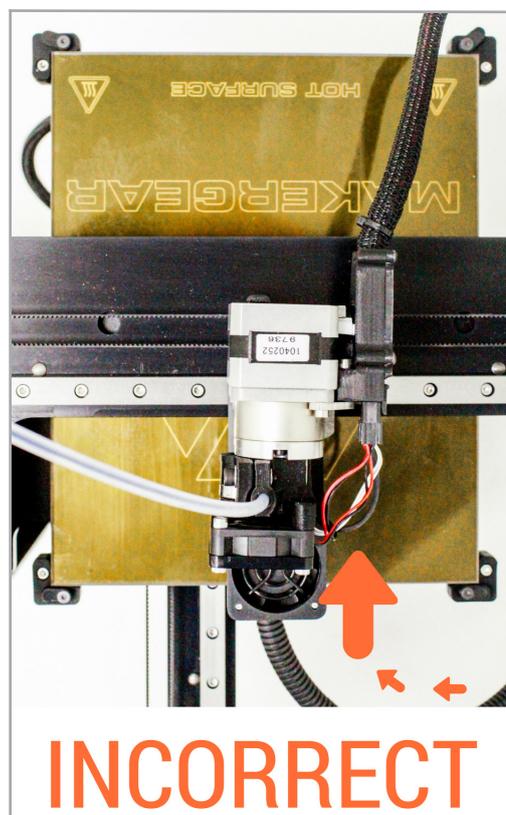
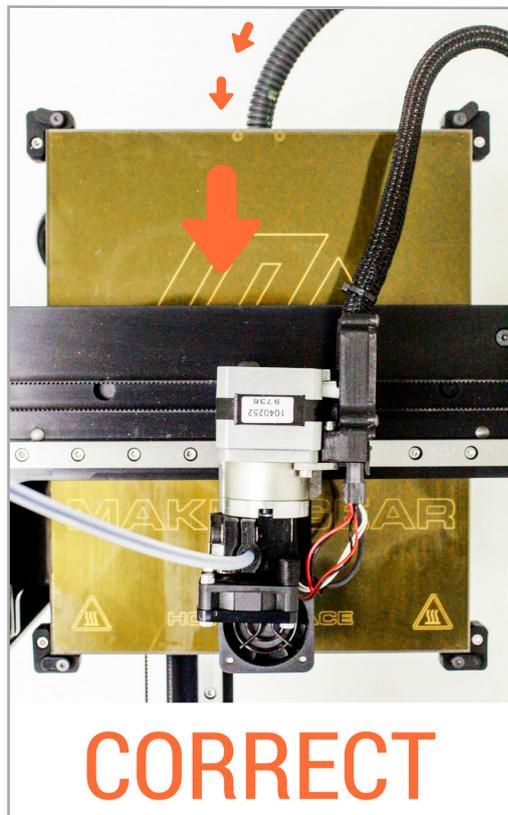


2. Remove foam from above and below the 4-legged “spider” inside the frame. Remove the heated build platform from its slot in the foam and place it on the spider with the glass build plate facing up, as shown on page 5.

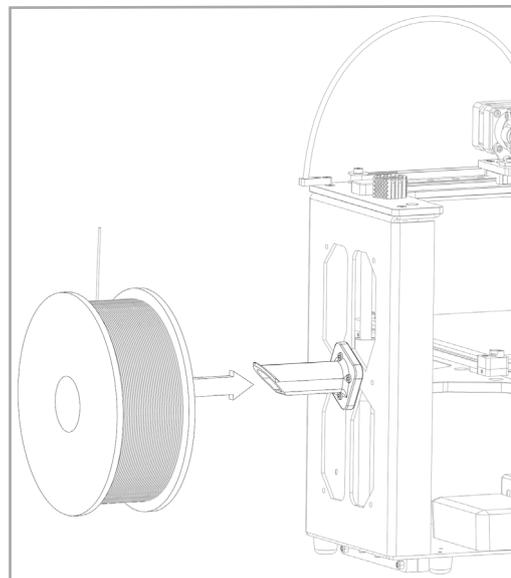
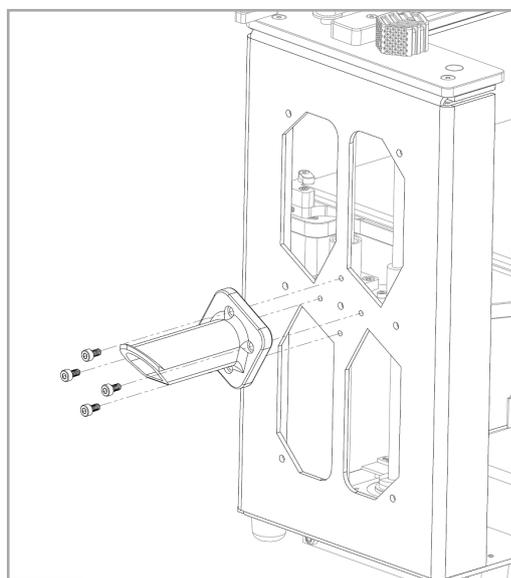


3. Grasp the printer where the arrows indicate, and remove it from the box.

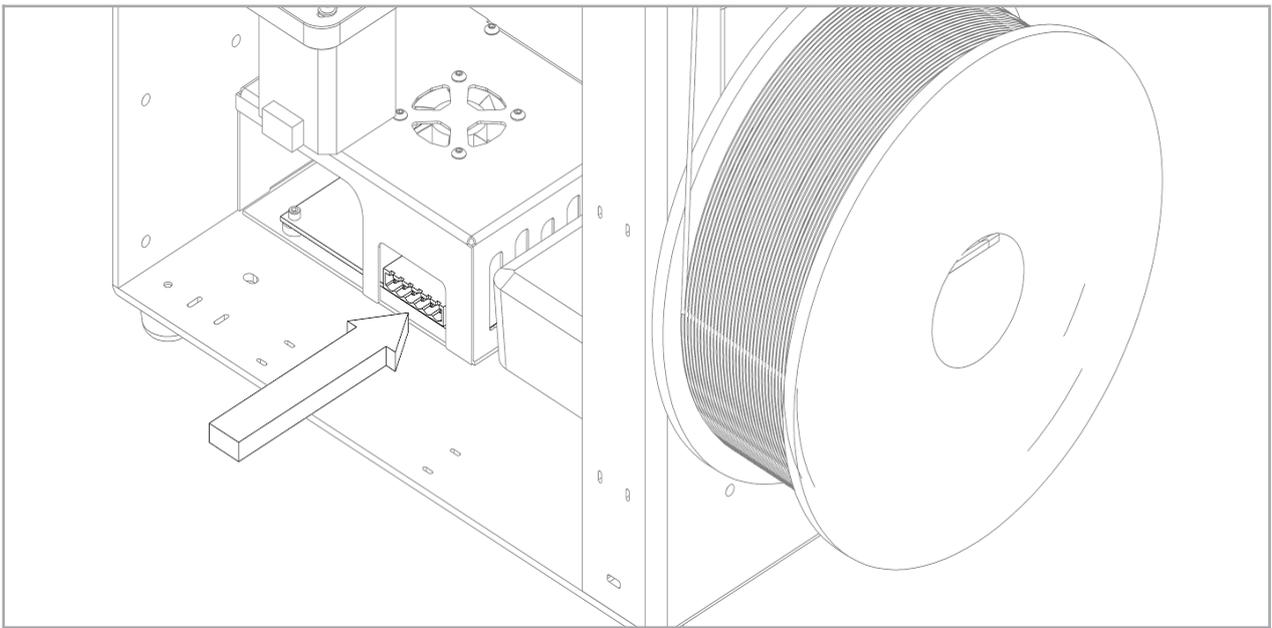
4. Remove the binder clip, and rotate the hold-down clips to point toward the front and back of the glass build plate in order to secure it in



5. Install the spool holder with the 4 included screws using the 3 mm allen key, ensuring that the longer side is facing up. Place the PLA spool on the spool holder so that the filament unwinds clockwise.



6. Insert the 6-position power supply connector into the 6-position electronics connector, making sure that it is **SECURELY IN PLACE** in the electronics case. Connect the power supply cord to the power supply. Next, plug the power supply into power outlet, and flip the switch on the power supply to the on position.





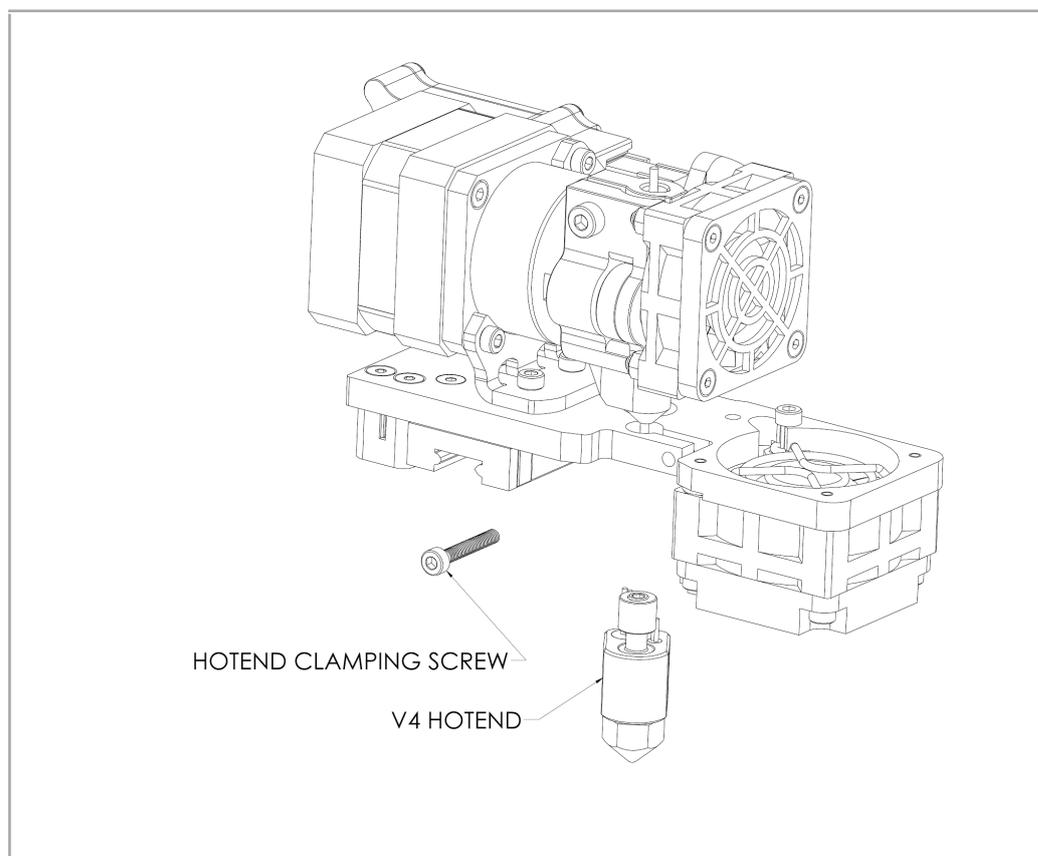
# A Note About Nozzles



The nozzle is the brass conical piece with a six sided base. It attaches to the other parts of the hot end and dispenses material through a precisely sized hole.

If you wish to remove or change the nozzle, you must first remove the entire hot end. Attempting to unscrew the nozzle directly from the M3-SE will damage the hot end.

Some of our users choose to print with nozzles that are either larger or smaller than the 0.35 mm nozzle included on the M3-SE in order to accommodate specific printing needs. If you plan to print with different-sized nozzles, we recommend keeping each nozzle installed in a separate hot end, as this allows you to switch between nozzles more



Visit the MakerGear YouTube channel for step-by-step instructions on how to remove the V4 hot end and remove/mount a nozzle.



# Software Setup



The onboard software supplied on the MakerGear M3-SE is a specialized version of OctoPrint called **OctoPrint for MakerGear**. It is an open-source, easy-to-use tool that gives users total control over their 3D printing workflow.

OctoPrint's basic functions include simple tasks such as controlling and monitoring your printer, as well as more advanced operations like slicing files. It can be expanded through its versatile plugin system, a diverse library of community-developed plugins offering specialized functionality, which is useful for all users.

Using a desktop or laptop computer, navigate to [setup.makergear.com](http://setup.makergear.com) and follow the provided steps.

**Step 1:** On the Setup page, enter your printer's serial number, which is located on the back of the printer. Next, connect your computer to the M3-SE's Wi-Fi, using the provided network name and password, in the same way that you would connect to any other Wi-Fi source.

**Step 2:** After moving to the Step 2 tab, click the temporary setup link and log in to OctoPrint with the provided username and password.

**Step 3:** OctoPrint will inform you that you are not connected to the internet. Click “[Wireless Configuration](#),” then select your home network and enter your home network’s password. Connecting may take a few minutes. If OctoPrint continues to say you are not connected to the internet, refresh the page.

You will not have to go through the setup process again unless you change networks or factory restore the printer. After you’re connected to the printer, proceed to OctoPrint’s Quick Check, which will help you load the filament and ensure that the heated build platform of the printer stayed level during shipping. Once you complete the Quick Check, the printer will be ready to print.



## Changing Filament

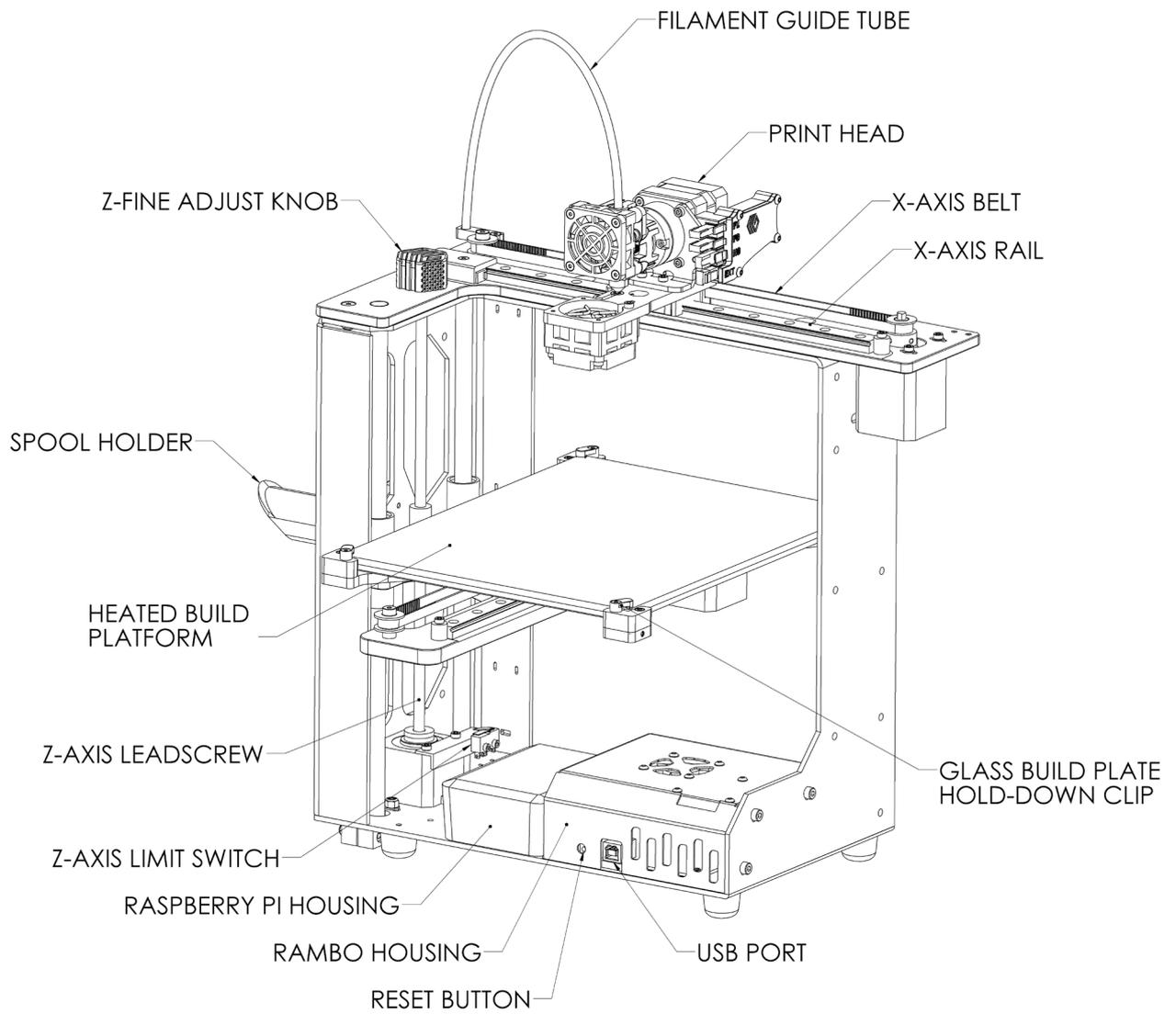


1. In OctoPrint, go to the “Temperature” tab to heat the extruder to the appropriate temperature. In the “Control” tab, select the tool you want to work with. If switching between filament materials (e.g., PLA to ABS), heat the extruder to the hotter of the two materials’ printing temperatures in order to purge the old material and properly extrude
2. In the “Control” tab, click “Retract” while pulling gently on the old filament until it is released from the filament drive.
3. Cut the end of the new material at an angle and feed it into the filament drive. While applying gentle downward pressure, click “Extrude” until you can see the filament extruding from the nozzle.



# M3-SE Features

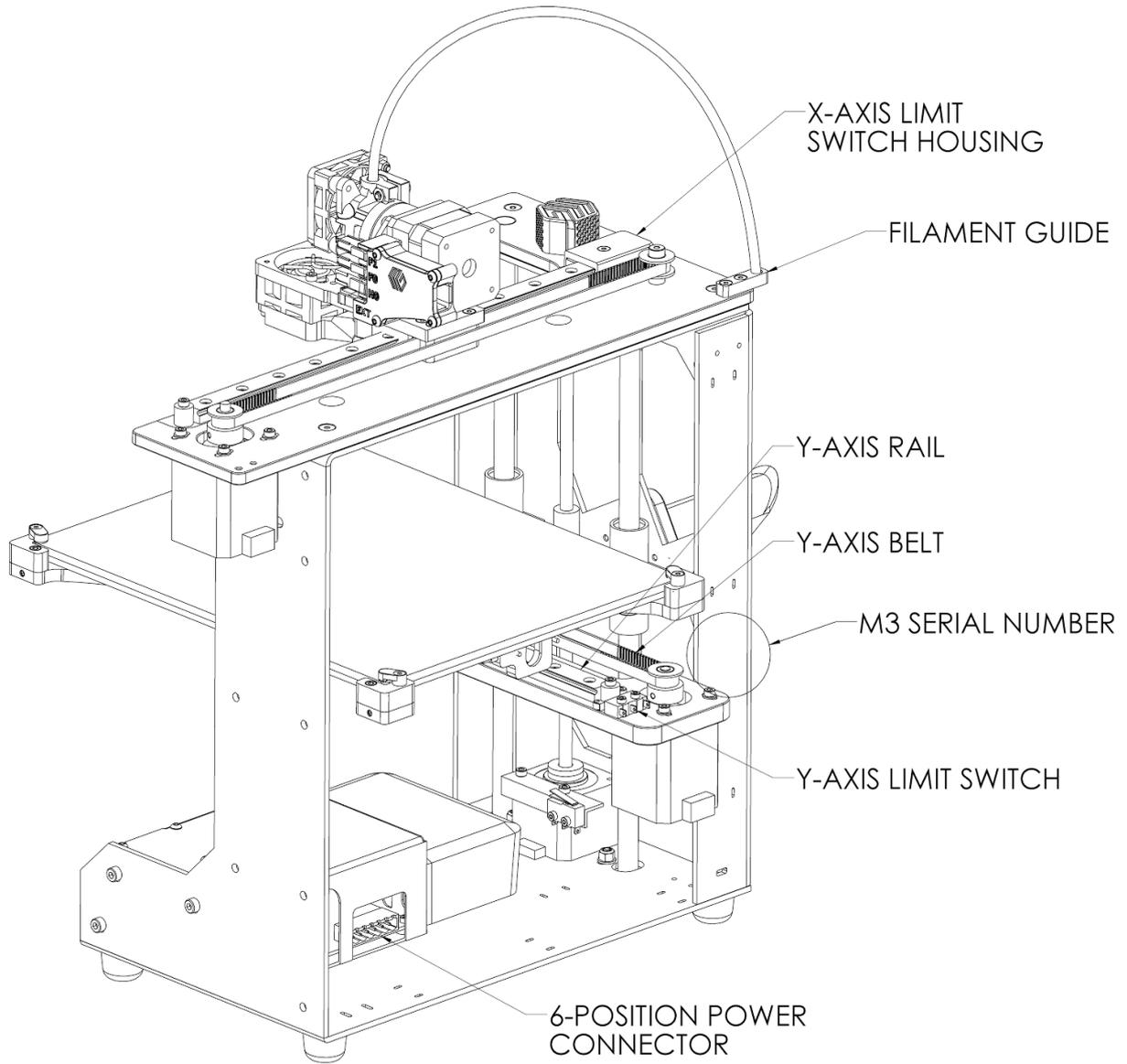
## Front





# M3-SE Features

## Rear

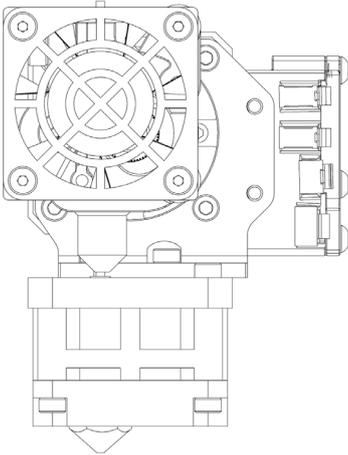




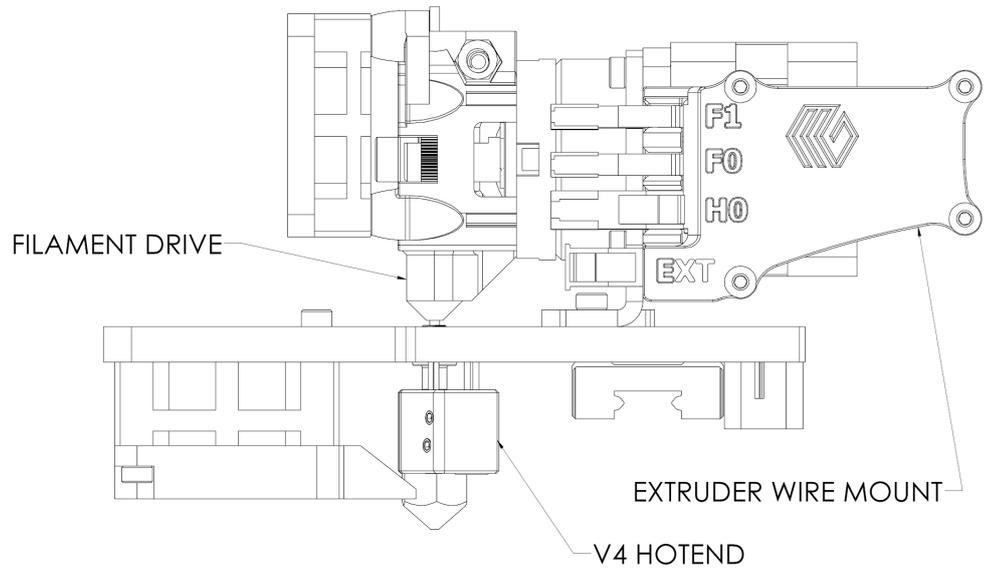
# M3-SE Features X-Stage Assembly



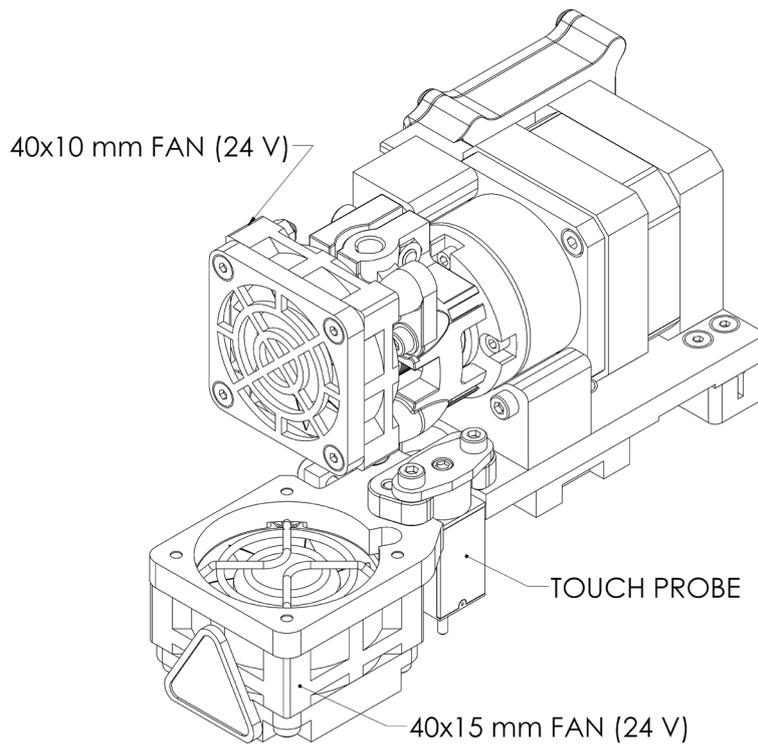
FRONT VIEW



SIDE VIEW



ISOMETRIC VIEW





# What's the Function?



## Simple explanations of M3-SE Features

**40x10 mm Fan (24 V)** cools filament drive and RAMBo board.

**40x15 mm Fan (24 V)** cools printed layers (as needed).

**6-Position Power Connector** brings low voltage DC power to M3-SE.

**Extruder Wire Mount** locates and clamps connectors for extruder.

**Filament Drive** pulls filament into extruder.

**Filament Guide** guides filament from spool to filament guide tube.

**Filament Guide Tube** guides filament from filament guide to filament drive.

**Glass Build Plate** (with polyimide film) serves as the print surface.

**Heated Build Platform (HBP)** controls glass build plate temperature.

**M3-SE Serial Number** is a unique identifier for each printer.

**Print Head** deposits printing material and cools print.

**RAMBo Housing** shields and cools RAMBo processor board.

**Raspberry Pi Housing** shields the Raspberry Pi communications module.

**Reset Button** resets the control electronics and shuts down the printer.

**Spool Holder** secures the filament spool during printing.

**Touch Probe** helps level the bed and ensure first layer adhesion.

**USB Port** allows communication between external computer and RAM-Bo.\*

**V4 Hot End** melts filament and controls extruded diameter of filament.

**X-Axis Belt** keeps extruder in-sync with X-motor.

**X-Axis Limit Switch** sets "home" position for X-axis motion.

**X-Axis Rail** guides extruder during side-to-side movement.

**Y-Axis Belt** keeps heated build platform in sync with Y-motor.

**Y-Axis Limit Switch** sets "home" position for Y-axis motion.

**Y-Axis Rail** guides heated build platform during front-to-back movement.

**Z-Axis Fine Adjust Knob** is for last-minute changes to the distance between nozzle and glass build plate.

**Z-Axis Leadscrew** rotates to move HBP up and down.



# Shutdown & Reset Procedures



## M3-SE Shutdown Procedures

Do not switch off the power supply to turn off the MakerGear M3-SE. There are two ways to properly shut it down:

1. Navigate to the printer's OctoPrint interface and click the power button icon. Next, click "Shutdown system," then, "Proceed."
2. To manually shut down the M3-SE, hold down the reset button for 10 seconds and release the button.

After performing either of these methods, you will hear a series of tones indicating that the printer has **a)** started the shutdown procedure and **b)** finished the shutdown procedure, and the green light to the left of the red light on the raspberry pi will flash and then shut off. Once the green light has turned off, it is safe to switch off the

## M3-SE Reset and Restore Procedures

The manual reset button, which is located on the front of the M3-SE, resets the control electronics. The manual reset button should not be used while the M3-SE is printing, unless you wish to stop the printer as quickly as possible.

- Pushing and releasing the reset button will reset the control electronics board.
- Holding down the reset button for more than 60 seconds before releasing will begin the system restore process. This should only be done in special circumstances, such as when passwords are lost. The system restore performs the following operations:
  1. Disconnects the printer from its current network and returns it to Access Point mode (AP mode).
  2. Resets the access point network name/password to its original factory state.
  3. Resets the OctoPrint username/password to its original factory state.



# Maintenance & Storage



## Weekly Maintenance (every 50 hours)

Ensure that the heated build platform (HBP) is at the correct height and properly leveled. To do so, log in to OctoPrint and proceed through the QuickStart process in order to complete the following steps:

- 1) Check Starting Height
- 2) Check HBP Level

Ensure that the glass build plate is free of defects (torn or bubbled polyimide tape) and dust/dirt/grease, and replace tape or clean surface with appropriate cleaner (alcohol/water at 50%/50% is recommended).

## Monthly Maintenance (every 200-250 hours)

Ensure that the printer is free of dust and filament debris, and clean it if necessary. Focus areas include fans and fan guards, filament surface and filament drive, and the entire frame. Clean oil from the X and Y linear rails and apply a fresh coat to each. A dot of oil in each of the long grooves on the X and Y rails is sufficient. Once applied, move each axis through its full travel multiple times to spread the oil.

## M3-SE Storage

- If you are using the M3-SE regularly, turn off and unplug the power supply when finished.
- If you are storing the M3-SE for a period of 1-2 weeks, follow the instructions listed above. Additionally, fully seal the filament spool in its original bag, preferably with a new desiccant packet inside.
- If you are storing the M3-SE for a period of 2 weeks or more, follow all above instructions, THEN cover the entire printer in order to protect it from the buildup of dust and other airborne particles.

**DO NOT** unscrew the nozzle directly from the M3-SE! To change or remove the nozzle, the entire hot end must be removed. Visit our website or the MakerGear YouTube channel for step-by-step instructions on how to remove the hot end and change the nozzle.



# Warranty & Support



## Warranty

New M3-SEs ordered from MakerGear or from an authorized MakerGear distributor have a Twelve-Month Limited Warranty. MakerGear will replace defective parts on M3-SEs that are under warranty. Replacement parts may be new or refurbished and include free shipping in the US. Non-US customers are responsible for shipping costs for replacement parts.

## Exceptions

The M3-SE has an open design (no proprietary cartridges) and M3-SE owners are free to use third party filament. However, the MakerGear hot end is only covered when MakerGear filament and authentic MakerGear components are used. Due to variance in quality, MakerGear is unable to provide technical support for issues related to third party filament. If you are using filament or extruder components from a third party, you must contact your supplier for technical support. The twelve-month warranty offered by MakerGear does not cover printer abuse.

## Support

Technical Support lives on our website at  
[www.makergear.com/pages/support](http://www.makergear.com/pages/support)

## Notice

This is a Class A product. In a domestic environment, this product may cause radio interference requiring the user to take adequate measures to mitigate. The MakerGear M3-SE can, in very rare cases, stop operating due to electrostatic discharge (ESD). Operation can be restored by turning the machine off and on again.



# About Us



Welcome to the family!

**Our company** began as a hobby in an unheated residential garage, way back in 2009, when our Founder & CEO, Rick, was hand-making parts for the fledgling desktop 3D printing community. Today, we apply strict standards to our printers, which are made and tested in the USA using domestic and foreign parts. Yet despite countless improvements and advancements during the years since MakerGear's humble beginnings, our dedication to quality and community remains unchanged.

**Our work** revolves around providing three things: quality printers, excellent customer service, and a user-centric 3D printing experience. Focusing on these three pillars has resulted in outstanding customer reviews, awards, and top-rated recognition in publications both in and out of the 3D printing world.

**Our customers** include schools, engineers, entrepreneurs, designers, businesses, and DIYers in more than 75 countries, many of whom are involved in our active, growing and extremely helpful community, located at [forum.makergear.com](http://forum.makergear.com).

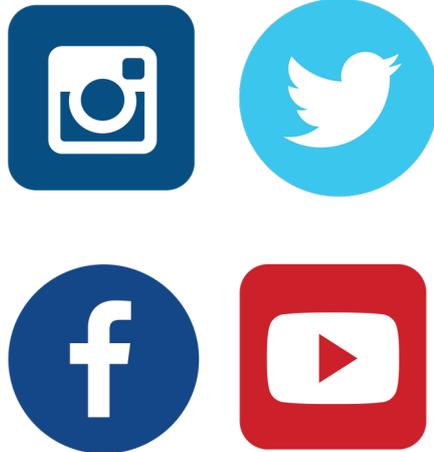
**For general inquiries**, you can reach us by email at [info@makergear.com](mailto:info@makergear.com).

**For technical assistance**, please visit our website's support page to access our support resources as well as instructions for how to submit a support ticket.

We're here when you need us. Now it's time to roll up your sleeves and create something! Thanks for choosing MakerGear.

The **Maker**Gear Team

What are you making? Tag  
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for a chance to be fea-



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