MONOPRICE

MP Maker Pro Mk.1

User's Manual

CONTENTS

SAFETY WARNINGS AND GUIDELINES

- Do not reach inside the printer during operation.

- Always allow the printer and extruded filament to cool before reaching inside.

- Take care to avoid touching hot parts, including heat blocks, extruder nozzle, extruded filament, and the heated bed.

- Do not wear gloves when operating or repairing to avoid entanglement.

- Keep the printer and all accessories out of reach of children.

- Do not remove or disconnect the USB cable when printing from a computer.

- Do not force or tear anything when unpacking and during setup. This may cause damage to the printer and/or its accessories.

- Ensure that the printer is turned off and unplugged from its power source before making repairs or performing service.

- Do not install this device on an unstable surface where it could fall and cause either personal injury or damage to the device and/or other equipment.

- Do not subject the product to extreme force, shock, or fluctuations in temperature or humidity.

- This device is intended for indoor use only.

- Do not expose this device to water or moisture of any kind. Do not place drinks or other containers with moisture on or near the device. If moisture does get in or on the device, immediately unplug it from the power outlet and allow it to fully dry before reapplying power.

- Do not touch the device, the power cord, or any other connected cables with wet hands.

- Prior to operation, check the unit and power cord for physical damage. Do not use if physical damage has occurred.

- Before plugging the unit into a power outlet, ensure that the outlet provides the same type and level of power required by the device.

- Unplug this device from the power source when not in use.

- Take care to prevent damage to the power cord. Do not allow it to become crimped, pinched, walked on, or become tangled with other cords. Ensure that the power cord does not present a tripping hazard.

- Never unplug the unit by pulling on the power cord. Always grasp the connector head or adapter body.

- Use only in a well-ventilated area. Do not use in close, confined spaces.

- Take care when using the scraper to remove a model. Never direct the scraper at your fingers or body.

- The printer is designed to operate with an ambient temperature ranging from +59°F (+15°C) to +86°F (+30°C), with a relative humidity from 20-50%. Printing outside these limits may result in low quality prints.

- Use eye protection when cleaning or sanding the printed models to avoid getting small particles in your eyes.

INTRODUCTION

Thank you for purchasing this MP Maker Pro Mk.1 3D printer! This printer features a single MK12 extruder and a heated, aluminum build plate. It can print any 1.75mm diameter filament with a melting temperature less than or equal to +250°C, including PLA, ABS, and most exotic materials. It has a 11.8" x 11.8" x 15.7" (300 x 300 x 400 mm) print area and can print at speeds up to 70mm/second with a layer thickness from 100-400 microns. It supports both manual and automatic build plate leveling.

FEATURES

- Single MK12 extruder with all metal hot end

- Aluminum, heated build plate

- Prints any 1.75mm filament with a melting temperature less than or equal to +250°C

- 70mm/second maximum print speed

- 100-400 micron layer thickness

- 11.8" x 11.8" x 15.7" (300 x 300 x 400 mm) print area

- Supports both manual and automatic build plate leveling

- Can operate with a nominal 110 VAC or 250 VAC line voltage

- Can print gcode files from a USB connection to a computer or from an SD™ card

CUSTOMER SERVICE

The Monoprice Customer Service department is dedicated to ensuring that your ordering, purchasing, and delivery experience is second to none. If you have any problem with your order, please give us an opportunity to make it right. You can contact a Monoprice Customer Service representative through the Live Chat link on our website **www.monoprice.com** during normal business hours (Mon-Fri: 5am-7pm PT, Sat-Sun: 9am-6pm PT) or via email at **support@monoprice.com**

PACKAGE CONTENTS

Please take an inventory of the package contents to ensure you have all the items listed below. If anything is missing or damaged, please contact Monoprice Customer Service for a replacement.

1x   MP Maker Pro Mk.1 3D Printer

1x MK12 Extruder

1x   Filament Spool Holder

1x   Filament Spool Stand

1x   AC Power Cord

1x   USB Cable

1x   8GB SD™ Card

1x   Hex Screwdrivers

1x   Hex Key Set

6x Hex Bolts

2x Plastic Belts

1x   Spool 1.75mm PLA Filament

1x   Nozzle Unclogging Tool

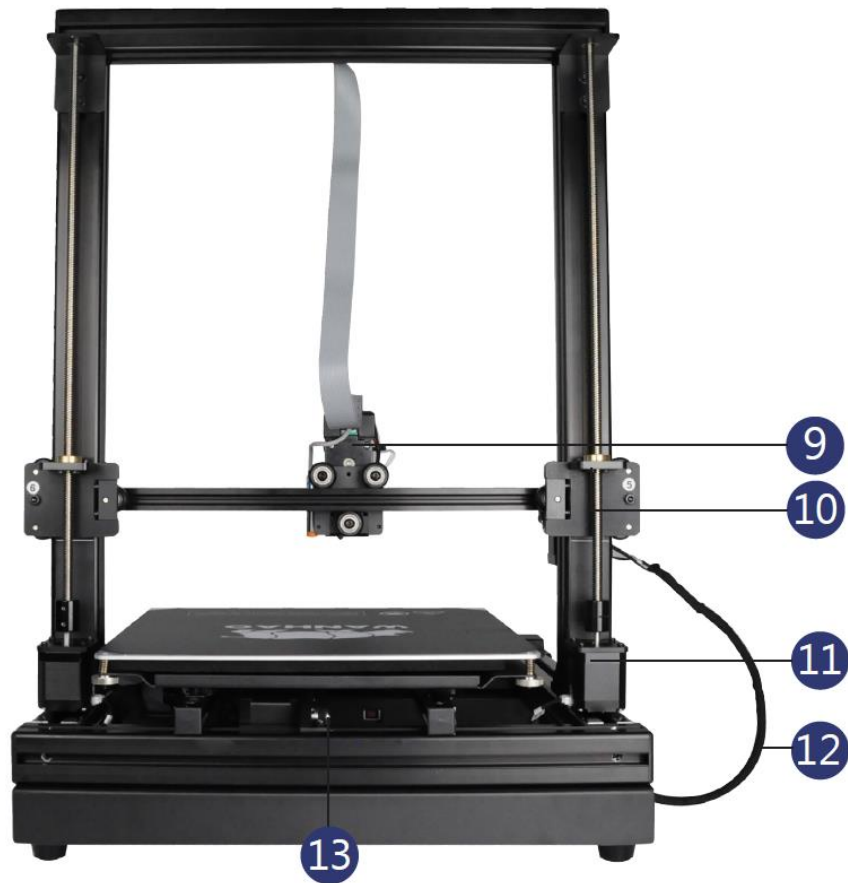1x   Quick Start Guide

1x   User's Manual

PRODUCT OVERVIEW

Front View
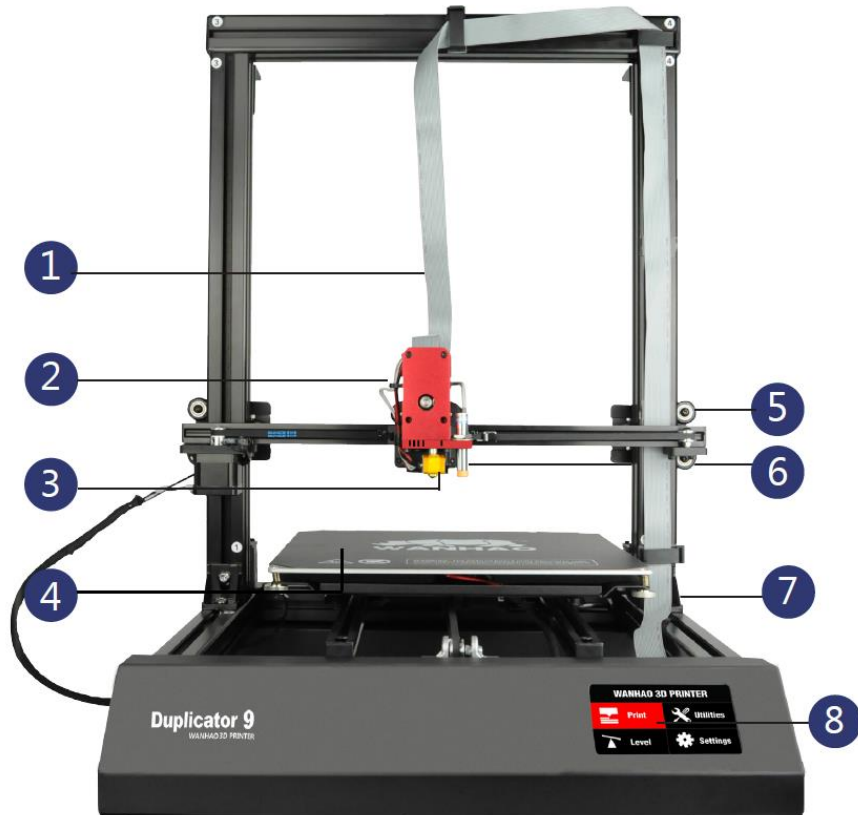
1. Extruder Cable

2. Near End Filament Feeding System

3. Full Metal Hot End

4. Heated Build Plate

5. Anti-backlash System

6. MK12 Full Metal Extruder

7. Locking Level System

8. LCD Touch Screen

Rear View

9. Anti-backlash System

10. Z-Axis Lead Screw

11. Super Precise Nozzle

12. Cable Chain

13. Y-Axis Bearing

GOOD 3D PRINTING PRACTICES

Before Printing

1. Ensure that your gcode file is correctly setup, with the filament diameter set to 1.75mm and the correct temperature settings for the type of filament you are printing.

2. Check that all cables and connectors are properly connected.

3. Check that the Heated Build Plate is level and approximately 0.1mm from the nozzle.

4. Check that the Heated Build Plate is clean and dust free, and that the nozzle does not have excess material stuck to it.
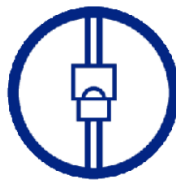
Always check Gcode file settings match filament and printer

Always check Print Mat is clean and there is no residual plastic

Always check Extruder & Print Bed Temperatures are set for correct filament type

Always check all cords are connected

Always check Extruder distance is 0.1mm from Print Mat

Always check Print Bed is level

During Printing

1. Closely monitor the first layer being printed. Most problems will occur in the first layer. If problems occur, stop the print process, remove the extruded filament, fix the source of the problems, then restart the print.

2. Do not leave the 3D printer unattended during operation.

3. Keep your hands clear while the machine is printing.

After Printing

1. Wait for the Heated Build Plate, Extruder, and printed model to cool before attempting to remove the print.

2. Carefully remove the 3D object. Never direct the scraper towards your fingers or body. Keep the scraper evenly flat when scraping to avoid damage to the Heated Build Plate and the Print Mat, which will affect adhesion for future prints.

3. Store the 3D printer in a clean, dry environment.

4. Store any unused filament in a manner that will not allow it to be exposed to moisture or humidity. For best results, use a vacuum sealed plastic bag with a silica gel pack inside to absorb any residual moisture.

ASSEMBLY AND MOUNTING

Remove all parts from the box and place them on a flat work surface. The parts pictured are the base, the two Z-axis pillars, the X-axis gantry, the X-axis rail, and the MK12 extruder.

2

Place the base on its side. Locate the Z-axis pillar with the sticker No.2. Slide the No.2 pillar into the base vertical locker, then tighten the bolt at the bottom of the base.

3

Tighten the locking bolt by turning it clockwise, then flip the base onto its other side and install the other Z-axis pillar onto the base using the same method.

4

Turn the base so that it rests on its feet and the Z-axis pillars are vertical. Loosen the two locking bolts at the top of the two Z-axis pillars (marked No.3 and No.4) by about 5mm, so there will be sufficient space for the X-axis gantry to slide in.

5

Remove the plastic end caps from the X-axis gantry, then slide it under the bolt heads and locking washers. Ensure that the No.3 and No.4 stickers are mated. If there is insufficient space for the gantry to fit under the bolt head, loosen it a bit more and try again.

6

Insert the hex screw driver through the holes in the top of the gantry and tighten the hex bolts. Double check all bolts to ensure that they are tight and that the gantry, pillars, and base assembly is steady and tight.

7

Insert the plastic end caps onto the ends of the X-axis gantry.

8

Screw the X-axis spacers (No.5 and No.6) onto the X-axis rail, but do not tighten them so much that the spacers cannot move along the rail.
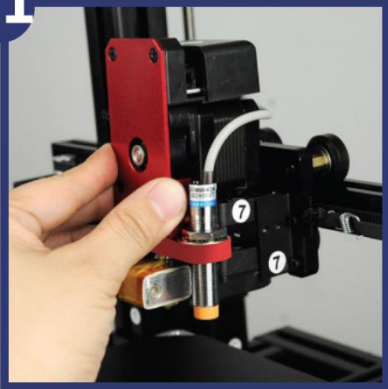
9
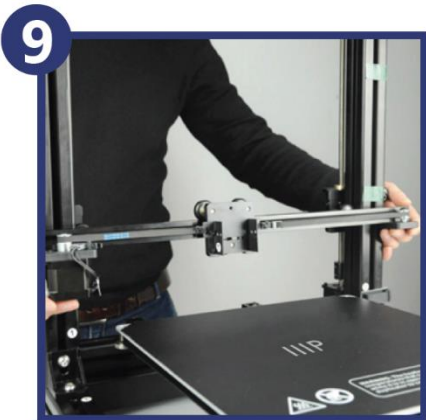
Mount the X-axis rail assembly by inserting the X-axis spacers in between the rubber wheels on the Z-axis steppers. You may need to slide the spacers a bit to one side or the other. Ensure that the X-axis rail is mounted symmetrically and that the extruder holder is facing the front of the printer.
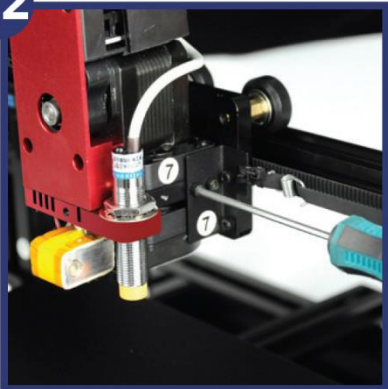
10

Using two hex bolts, secure the X-axis spacers to the Z-axis steppers.

11

Insert the MK12 extruder into the extruder holder on the X-axis rail.

12

Using the four remaining hex bolts, secure the extruder the X-axis rail assembly in four places, two on each side.

WIRING
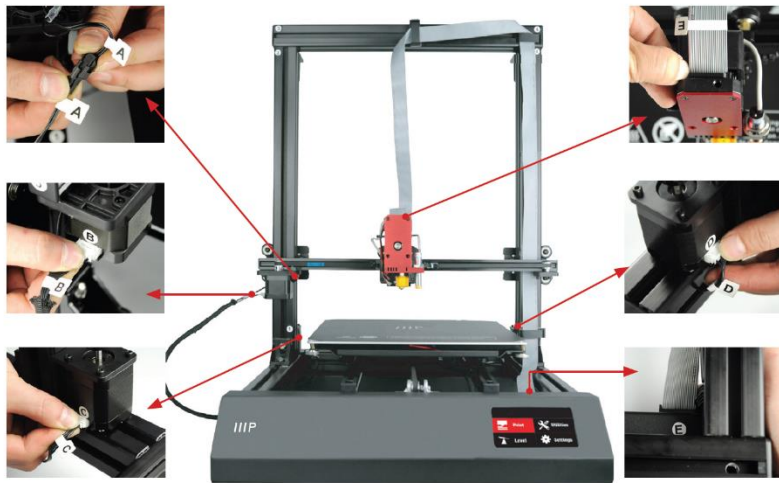
Connect the wires and cables as shown in the image to the left. Route the ribbon cable through the ribbon cable clips before connecting it at each end.

AUTOMATIC LEVELING
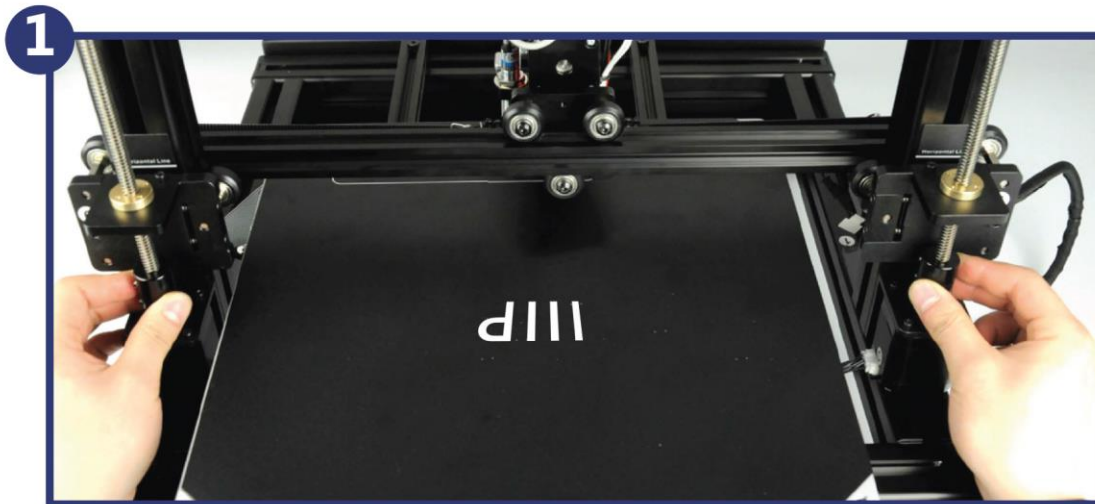
Turn the couplers on the Z-axis steppers to make the X-axis rail level. Use a small level on the X-axis rail to ensure that it is level. It must be level for proper bed calibration.

Plug the included AC power cord into the printer, then plug the other end into a nearby AC power outlet. Flip the power switch on the printer to turn it on. From the Home page on the printer screen, select **Level > Auto level** to initiate the automatic bed leveling procedure.

Note: Once the auto leveling is complete, the printer will remember the leveling data for future printing. You don't have to level the bed each time, unless you feel it may not be leveled. Auto leveling is for general printing purposes. If you need some special layer thickness or other special purposes, you may need to adjust the four bolts under the bed to achieve a more precise distance.

If auto leveling doesn't meet your needs, choose the **Manual level** option and follow the instructions that will appear on screen.

Congratulations, your new 3D printer is now ready for use!

MANUAL LEVELING

While automatic leveling is sufficient for most tasks, manual leveling can achieve more accuracy for printing at higher resolutions. Perform the following steps to manually level the build plate.

1. With the printer turned on, press **Utilities > Change Filament > Raise Extruder** to raise the extruder to allow easy access to the build plate.

2. Turn the printer off.

3. Use a small level to ensure that the X Axis rail is level. If it is not level, turn the Z Axis Lead Screws on either side until it is level.

4. Squeeze each corner of the build plate and tighten the nut to lower the build plate.

5. Wipe the build plate with a clean, dry, lint-free cloth to remove any dust.

6. Turn the printer on.

7. Once the printer has finished initializing, press **Utilities > Home XYZ** to move the extruder and build plate to the home position.

8. Turn the printer off.

9. With the power turned off, manually move the extruder to each corner and to the middle of the build plate. Use a sheet of ordinary printing paper to check the distance between the build plate and the extruder nozzle. Loosen the knobs at each corner to reduce the distance between the build plate and the extruder nozzle until there is some slight resistance to moving the paper. Keep adjusting and testing until the proper gap is present at all points.

ADDING FILAMENT

Preform the following steps to insert filament into the extruder.

1. Open your filament. Using a pair of scissors or side cutters, diagonally snip the end of the filament to make a point, as shown in the images below. Place the spool on the **Filament Holder.**
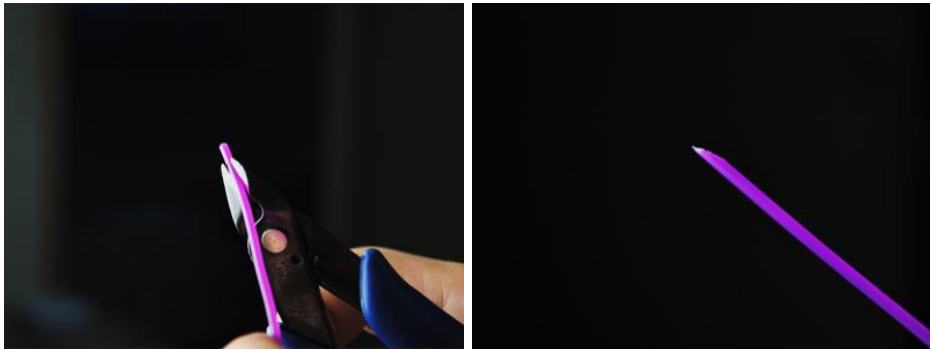
2. Squeeze the filament feed lever on the extruder, insert the filament into the hole on top of the extruder, then release the lever to lock the filament in place.

3. Turn the printer on and allow it to finish initialization.

4. Press **Utilities > Change Filament > Add Filament.** The printer will automatically preheat and then feed filament into the extruder. Press the **Back** button after several centimeters of filament have been extruded.
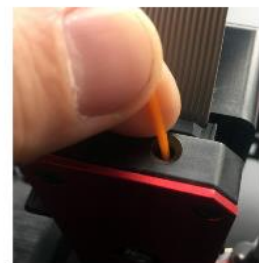
REMOVING FILAMENT

Perform the following steps to remove filament from the extruder.

1. With the printer turned on and initialized, press **Utilities >Change Filament > Remove Filament.** The printer will automatically heat and, once the target temperature is reached, will remove the filament from the extruder.

2. Store any unused filament in an airtight bag. For best results, store it in a vacuum sealed bag with a silica gel pack to remove any residual moisture.

MENU MAP

Main Menu

Print

Level

Utilities

Settings

Level Menu

Auto Level

Manual Level

Utilities Menu

Home XYZ

Move XYZ

Cooldown

Change Filament

Disable Motor

Change Filament Menu

Add Filament

Remove Filament

Raise Extruder

Preheat PLA

Preheat ABS

Settings Menu

PID Settings

Motor Settings

Factory Reset

DEFAULT SETTINGS

The printer has been set at the factory with the following values for optimal print quality.

General

Baudrate: 115200

Stepper Inactive: 360s

Max Inactive: 0s

Acceleration

Print X: 1000

Print Y: 1000

Print Z: 1000

Move: X

Move: Y

Move: Z

Jerk: 20.0

Z-Jerk: 0.3

Feedrate

Max X: 200

Max Y: 200

Max Z: 2

Home X: 40

Home Y: 40

Home Z: 2

Extruder

Steps/mm: 96.0

Start FR: 20

Max FR: 50

Accel: 5000

Stab. Time: 1

Wait Units: 0mm

Wait Temp.: 150C

Control: Dead Time

DT/PID P: 7.00

PID I: 2.00

PID D: 40.00

Drive Min: 40

Drive Max: 230

PID Max: 255

CURA

Cura is a program that lets you load a premade model file, adjust it to your liking, then slice the model to create a gcode file, which can be printed from the included SD™ card. We have included a version of Cura on the SD card that has already been configured with the proper settings for this printer.

To install Cura, insert the SD card into a card reader, then run the Cura executable on the root directory of the SD card. Follow the onscreen instructions to complete the installation.

PRINTING FROM SD CARD

Perform the following steps to print a model from an SD™ card.

1. With the printer turned off, insert an SD card with saved model files into the SD card slot.

2. Turn the printer on.

3. Press **SD Card > Print > Print File**.

4. Locate and select the desired gcode file to print. The printer will begin heating the extruder and build plate, then will begin printing once the target temperatures are reached.

REMOVING PRINTED MODELS

Perform the following steps to remove a printed model from the build plate.

1. Wait for the build plate, extruder, and printed model to fully cool before reaching into the printer to remove the model.

2. Using the included scraper, slide it under a corner of the model. Ensure that the blade is not directed at your fingers or body.

3. While keeping the scraper as level with the build plate as possible, work it under the model to lift it from the build plate.

Clean up the model by removing any support structures and sanding it, as needed. Always use eye protection when cleaning the model to prevent particles from getting into your eyes.

SERVICING

Replacing the Print Mat

The print mat helps with model adhesion during printing. With continued use, the mat can become damaged, which can negatively affect adhesion and removal of finished models. Perform the following steps to replace the print mat.

1. Slowly peel the print mat from the build plate starting at one corner. Note that heating the build plate slightly can make it easier to remove the print mat.

2. Using rubbing alcohol and a microfiber towel, carefully remove any residual adhesive from the build plate.

3. Peel the protective paper from the back of the replacement print mat, then carefully attach it to the build plate, making sure to align the edge of the new mat with the build plate.

Note: If you do not have a replacement print mat, you can use masking tape instead. We recommend using blue painter's tape.

Cleaning the Nozzle

From time to time the extruder nozzle can become clogged. Perform the following steps to clean it.

1. Remove the existing filament by following the instructions in the *REMOVING FILAMENT* section.

2. Select **Utilities > Change Filament > Raise Extruder** to raise the extruder to allow access to the nozzle.

3. Heat the extruder to 215°C.

4. Using the included Nozzle Unclogging Tool (or a 0.4mm drill bit), insert the tool into the nozzle, while twisting to "drill" into the material in the nozzle.

5. Remove the tool from the nozzle, while twisting.

6. Repeat steps 4 and 5 three times, then follow the steps in the *ADDING FILAMENT* section.

Routine Component Maintenance

- **Motor Connections:** Routinely check the cable connections to ensure that all connections are secure. Inspect the cables and connectors for damage.

- **Axis Lubrication:** Regular lubrication of the X and Y Axis rods is important for longevity and smooth running of the printer. The rods can be lubricated with oil or grease applied generously to both axis rods.

- **Nuts and Bolts:** Periodically check the nuts and bolts to ensure that they are firmly tightened.

TROUBLESHOOTING

Q1:   There is a clicking sound from one of the stepper motors.

A1:   One of the stepper motors may not be connected properly. Check each connection, then inspect the cables for damage.

Q2:   The selected print model on the SD™ card is not printing.

A2:   Remove the SD card from the printer, then mount it on your computer. Using a text editor (e.g., Notepad), open the gcode file and check for the presence of multiple ÿÿÿÿ symbols. If there are, the file is corrupted. Try reformatting the SD card, then reloading the gcode file. Note that reformatting the SD card will delete all files.

Q3:   The nozzle is not extruding material when starting to print.

A3:   Verify that the extruder temperature has been set to the correct value for the type of material being printed. Try cleaning the nozzle.

Q4:   The model is not sticking to the build plate.

A4:   Ensure that the build plate is clean and free from dust. Ensure that the bed is level and set to the correct height (0.1mm). Ensure that the print mat is not damaged. If it is, replace it with another print mat or blue painter's masking tape. Add a brim or raft to your model file. Ensure that the build plate temperature is set to the correct value for the type of material being printed.

Q5:   Printed models warp or curl.

A5:   Ensure that the build plate temperature is set to the correct value for the type of material being printed. Check the infill % of the gcode. The higher the infill, the more likely the model is to warp. Add a brim or raft to your model file.

Q6:   The model appears very "stringy".

A6:   Ensure that the filament diameter is set to match your filament (1.75mm), then try recreating the gcode file again. Ensure that the extruder and build plate temperatures are set to the correct values for the type of filament being used.

Q7:   The print stops somewhere in the middle.

A7:   Ensure that the gcode file is complete and is not corrupt. Check the original model file.

Q8:   The motor does not stop at the end of the axis.

A8:   Check that the stop micro switches are aligned with the motor mount and are registering.

Q9:   The extruder and/or build plate do not move.

A9: Disable the stepper motors and verify they the part can be moved. Clear anything that is blocking the path. Ensure that the motor is turning using the Utilities menu. If the motor turns but the belt does not, you will need to tighten the motor gear nut.

Q10: The printer isn't turning on.

A10: Verify that the power cord is fully inserted into the printer and that it is plugged into a live AC power outlet.

Q11: The SD™ card is not showing.

A11: Navigate to the SD Card menu, then select Unmount SD Card. After the card is finishing unmounting, select the Mount SD Card option. The card should now show in the menu.

TECHNICAL SUPPORT

Monoprice is pleased to provide free, live, online technical support to assist you with any questions you may have about installation, setup, troubleshooting, or product recommendations. If you ever need assistance with your new product, please come online to talk to one of our friendly and knowledgeable Tech Support Associates. Technical support is available through the online chat button on our website **www.monoprice.com** during regular business hours, 7 days a week. You can also get assistance through email by sending a message to **tech@monoprice.com**

SPECIFICATIONS

Model	33013
Extruder	MK12 Extruder with Full Metal Hot End
Build Plate	Heated Aluminum Build Plate
Printing Area	11.8" x 11.8" x 15.7" (300 x 300 x 400 mm)
Supported Materials	Any material with a melting point ≤250°C
Filament Diameter	1.75mm
Maximum Print Speed	70mm/sec
Layer Thickness	100 ~ 400 microns
Motor Accuracy	X: 0.012mm Y: 0.012mm Z: 0.004mm
Supported Software	Cura, Repetier Host, Simplify 3D
Input Power	110 VAC or 250 VAC, 50/60Hz, 4A
Weight	44.1 lbs. (20 kg)

SD™ is a trademark of SD-3C, LLC.