



MONOPRICE

MP Delta Pro 3D Printer



P/N 30993, 33346

User's Manual

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SAFETY WARNINGS AND GUIDELINES

Please read this entire manual before using this device, paying extra attention to these safety warnings and guidelines. Please keep this manual in a safe place for future reference.

- Be careful not to damage the glass build plate.
- Take care to avoid touching hot parts, including heat blocks, nozzle, extruded filament, and the heated build plate.
- Keep the printer and all accessories out of reach of small children.
- Do not remove or disconnect the USB cable when printing from a computer.
- Do not pull or twist the black cable harness at any time.
- Do not force or tear anything during unpacking and setup. This may cause damage to the printer and/or its accessories.
- Do not reach inside the printer during operation. Always allow the printer and extruded filament to cool before reaching inside.
- 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.
- Use only in a well-ventilated area. Do not use in confined spaces.

- 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.

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 or via email at support@monoprice.com. Check the website for support times and links.

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 Monoprice Delta Pro 3D Printer
- 1x MP Select PLA Plus Filament Roll (Black, 1 kg)
- 1x Spare PTFE-lined Nozzle
- 1x Spare All-metal Nozzle
- 1x Auto-level Sensor
- 1x 1.5mm Hex Wrench
- 1x 2mm Hex Wrench
- 1x Touchscreen Stylus
- 2x Spare Bowden Clips
- 1x User's Manual

SLICING SOFTWARE

We recommend the use of the KISSlicer slicing software to slice your models and create the gcode print files. You can download a version of KISSlicer that is preconfigured for use with the Delta Pro printer from the product page (30993/33346) on the monoprice.com website.

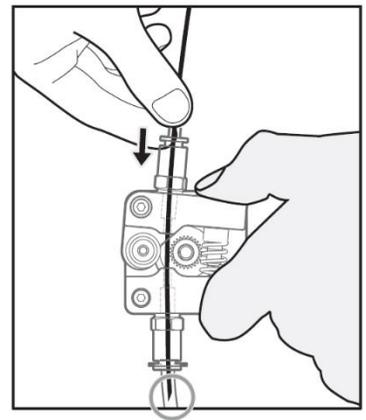
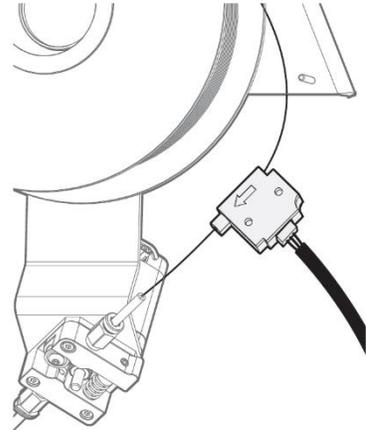
SLICER SETTINGS

If you choose to use slicing software other than KISSlicer, use the settings in the table below to configure it for use with the Delta Pro 3D printer.

Build Plate/Bed Diameter	270mm
Build Envelope Height	340mm
Firmware	5D Absolute E
File Extension	.gcode
Fan On	M106 (fan can do PWM or blip to speed)
Fan Off	M107 (fan can do PWM or blip to speed)
Bottom, Top, and Perimeter Speeds	30mm/sec
Loops and Infill Speeds	60mm/sec
Travel Speed	100mm/sec
Z-speed	50mm/sec
Maximum Acceleration	1000mm/sec
Extrusion Width	0.4mm
Minimum Flow Rate	1mm/sec
Maximum Flow Rate	4mm/sec
Destring/Retraction Distance	3-6mm
Destring/Retraction Speed	100mm/sec

LOADING FILAMENT

1. Place the filament spool on the holder so that the end of the filament hangs down to the right.
2. Using a pair of scissors or diagonal cutters, cut the end of the filament at an angle.
3. Gently straighten about 2" of the end of the filament with your fingers, so that it is easier to feed through the sensor and extruder.
4. Remove the filament sensor from its holder, then feed the end of the filament through the sensor and into the tube on the right side of the extruder.
5. Pinch the extruder idler lever and push the filament past the gear and into the Bowden tube, just past the pneumatic connector.
6. Turn the printer on, then preheat the nozzle to the appropriate temperature for the material being used (e.g., 200°C for PLA).



7. Once the nozzle is up to temperature, touch  >  > Load.



UNLOADING FILAMENT

1. Turn the printer on, then preheat the nozzle to the appropriate temperature for the material being used (e.g., 200°C for PLA).
2. Once the nozzle is up to temperature, touch  >  > **Unload**.



3. Hold the filament sensor and carefully rotate the filament spool while the filament is unloading to avoid tangles.

*IMPORTANT: When removing the end of the filament from the sensor, carefully string it through to hole in the spool to avoid overlapping and tangles, which **WILL** cause filament jams and failed prints.*

SWAPPING HOTENDS

The Delta Pro's hotend is easily swappable, so you can print with different materials at different temperatures. While we always recommend using the default, PTFE-line hotend for use with PLA and many other low-temperature materials, the included all-metal hotend allows you to print with materials that require higher temperatures than what the PTFE can handle. Perform the following steps to remove and replace the hotend.

1. Turn on the printer, then preheat the nozzle to the appropriate temperature for the material being used (e.g., 200°C for PLA).
2. Unload the filament.
3. Cool down the hotend, then turn the printer off.

4. Remove the Bowden tube from the effector by removing the plastic pneumatic connector clips and depressing the top of the connector while pulling the tube.
5. Disconnect the heater and thermistor connectors from the cable harness.
6. While holding the hotend, use the included 1.5mm hex wrench to loosen the two headless hex screws on the side of the heat sink below the effector, then remove the hotend.
7. Install the new hotend in the same orientation, then tighten the screws.
8. Reconnect the heater, thermistor, and Bowden tube, ensuring that the tube is pushed all the way in.

PRINTING A MODEL

1. On the LCD screen, touch .
2. Use the up and down arrows on the right side of the screen to highlight the desired gcode file, then touch .
3. Touch **YES** on the **PRINT MODEL?** dialog to begin printing.



AUTO LEVELING

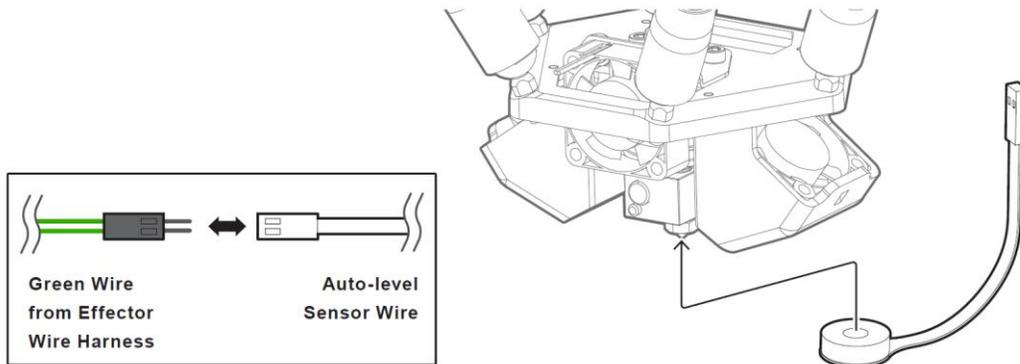
Before you begin your first print, and anytime you remove the build plate, you should run an auto-level to ensure that your models adhere properly to the build plate. Perform the following steps to auto-level the printer.

1. Ensure that the hotend is at room temperature.

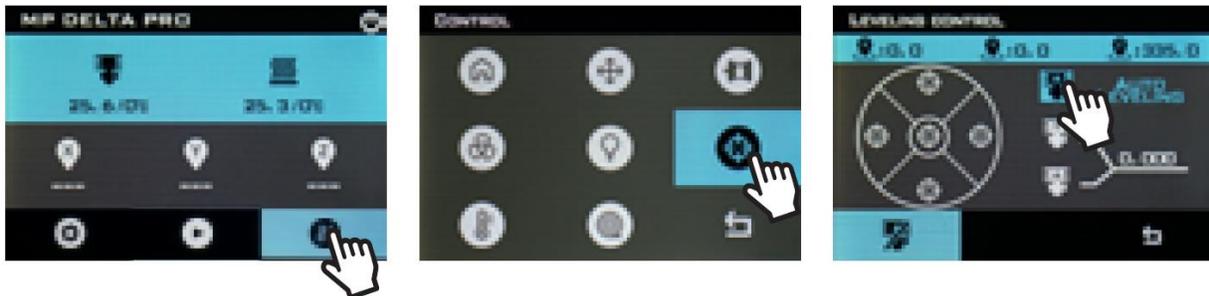


2. Connect the auto-level sensor to the green wire from the cable harness, then attach the sensor's foam ring to the nozzle.

IMPORTANT: Use the minimum amount of force required to attach the sensor to the nozzle. If the nozzle is touching the plastic membrane, it may prematurely trigger the switch.



3. Touch  >  >  AUTO LEVELING.

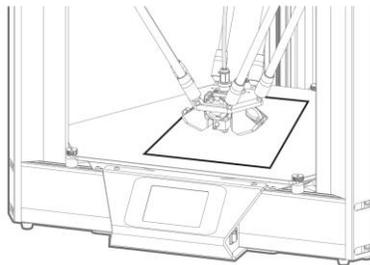


- Once the process is complete, remove the auto-level sensor.

ADJUSTING THE Z-OFFSET

The Z-offset is the distance between the glass build plate and the nozzle. The auto-level process ensures that this distance is consistent across the build plate, but the distance itself must be manually calibrated. You can easily do this using a piece of clean, flat copy/printer paper, which is usually about 100 microns thick. Perform the following steps to adjust the Z-offset.

- Touch  > .
- Place a piece of copy/printer paper on the build plate.



- Touch  in the middle of the screen.



- Touch  or  to adjust the height of the nozzle up or down.



5. Adjust the height of the nozzle until it pinches the paper, checking each time whether the paper can be moved or not. Once the paper cannot be moved, return to the main menu and touch  to home the printer.

CLEANING THE BUILD PLATE

To prepare the build plate for printing, first ensure that the build plate is at room temperature, then use rubbing alcohol or another ammonia-free solvent and a soft, lint-free cloth to remove any dust and oil from the surface.

CALIBRATING THE PRINTER

Your Delta Pro 3D printer was calibrated at the factory to ensure great prints out of the box. However, sometimes it may be necessary to recalibrate certain functions over the natural course of use.

Calibrating Dimensional Accuracy

If you find that the dimensions of your prints differ from the dimensions of your CAD model beyond 10 microns or so, you may want to adjust the firmware to correct the discrepancy. Perform the following steps to calibrate the dimensional accuracy.

1. Go to the Delta Pro page (30993/33346) on the monoprice.com website and download the **Sample Prints for Calibration** package.
2. Print the calibration box gcode file.
3. Carefully measure the printed model with calipers, aligning the jaws with the layer lines and record the dimensions.
4. Touch  > **Structure**. Note the **Push Rod Length**. Calculate a new Push Rod Length using the following formula:

New Value = Old Value x (Measured Printed Dimension / 3D Model Dimension)

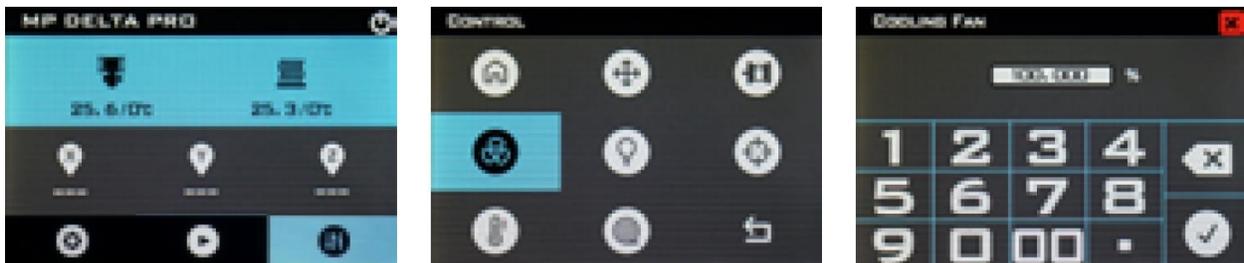
5. Touch **Push Rod Length**, erase the old value, then enter the new value.



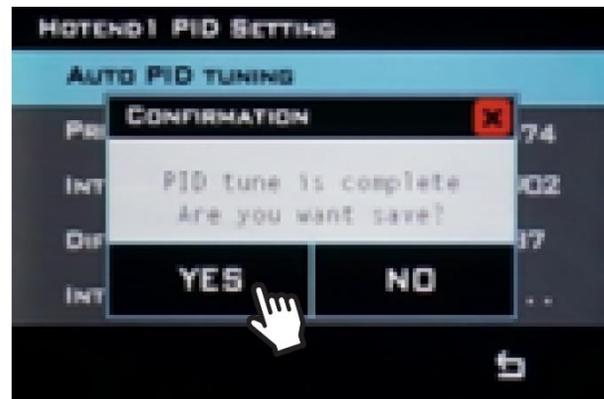
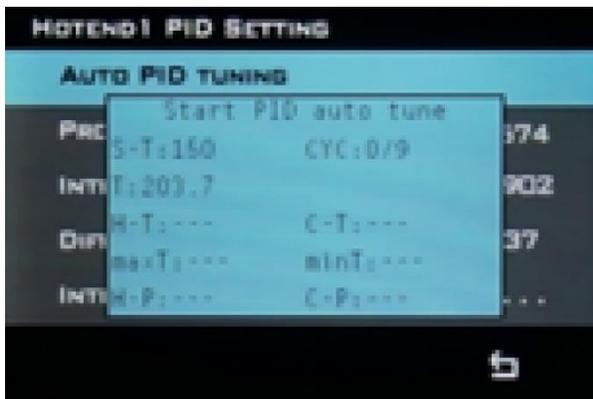
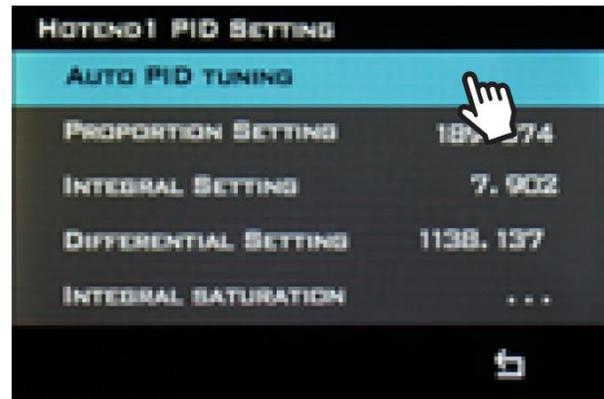
PID Tuning

If you find that the nozzle fails to maintain a stable temperature or fails to reach the target temperature, you can run the auto-PID tuning procedure to attempt to correct the issue. If nozzle temperature issues persist after running the auto-PID tune, you may need to replace the thermistor or heater. Perform the following steps to run an auto-PID tune.

1. The tuning process varies slightly depending on the nozzle hotend type and the target temperature of the material you are using. For the PTFE-lined nozzle, turn the part cooling fans (side fans) to 100% power before proceeding to tune the PID. Leave the fans off for the all-metal nozzle and materials with target temperatures higher than 260°C. To control the fans, touch > . Set the fans to 100% (default) or 0%, then touch .



- Touch  > Temperature > Hotend 1 Settings > PID Settings > Auto PID Tuning.
Wait for the process to complete.



PREFERENCES

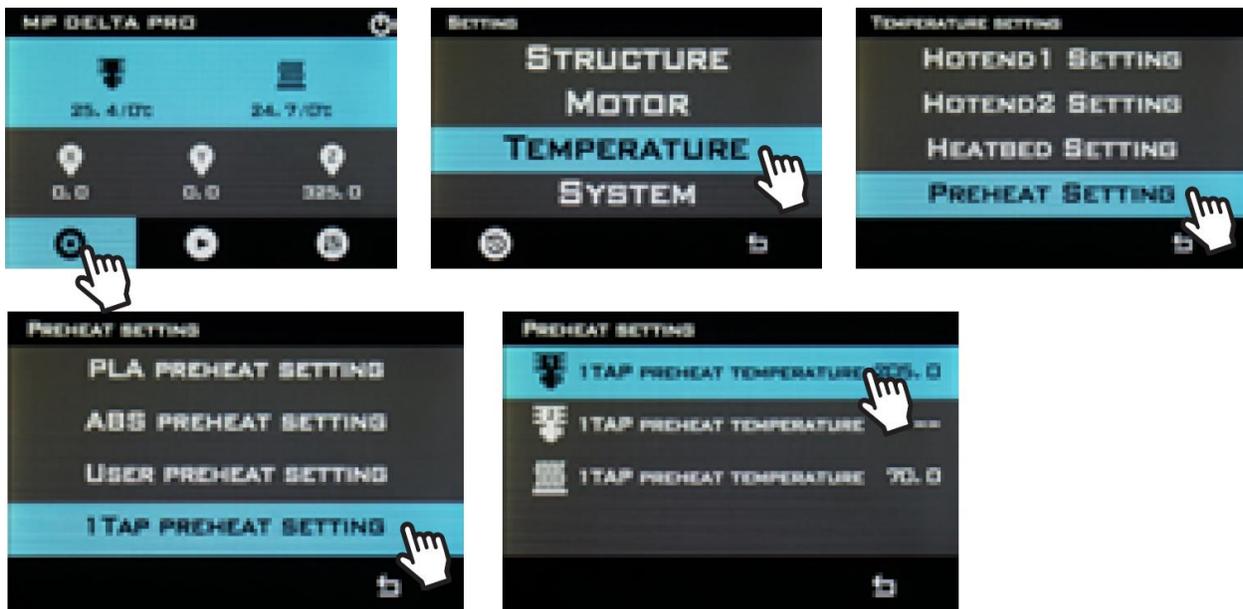
Changing the LCD Screen Color

To change the LCD screen color, touch  > System > .



1 Tap Preheat Temperature

You can change the default 1 Tap preheat target temperature by touching  > Temperature > Preheat Setting > 1 Tap Preheat, then enter the desired target temperature value.



Maximum Temperatures

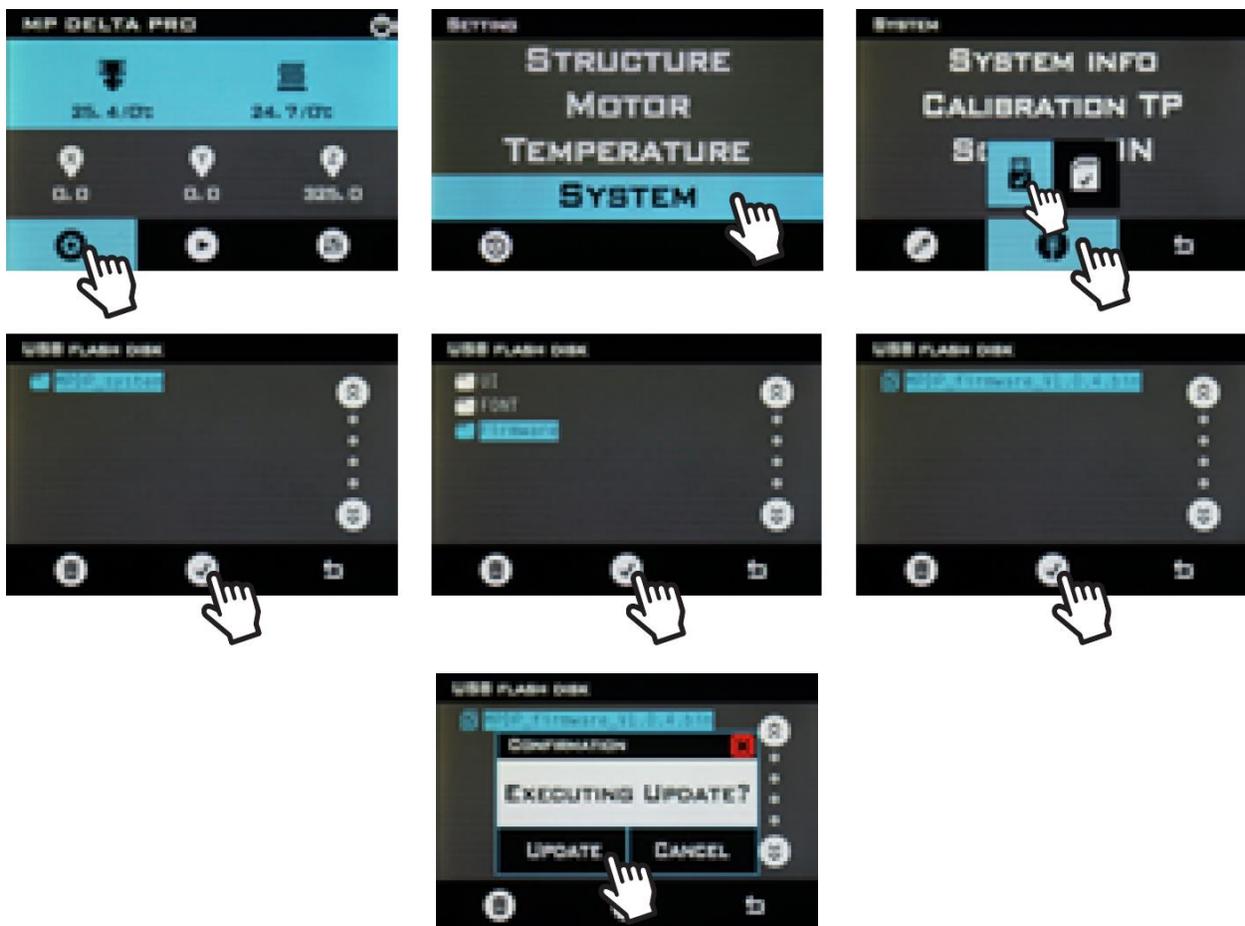
By default, the maximum temperatures allowed by the firmware are set to the maximum safe operating temperature of the PTFE-lined hotend, which is 260°C. If you want to increase this while using the all-metal hotend, touch  > **Temperature** > **Hotend 1 Setting** > **Max Temperature** and enter a value at least 5°C higher than the desired target temperature to allow the PID to function properly.



UPDATING THE FIRMWARE

In the event that the printer's firmware has been updated, it will be linked on the product page (30993/33346) on the monoprice.com website. You should download and install the latest firmware. Perform the following steps to update the firmware.

1. Download the zip file containing the updated firmware files, then extract the files to a USB flash drive.
2. Touch  > System > .
3. Select the folder containing the .bin firmware file, then touch **Update**.
4. Touch  > System > .
5. Select the folder containing the .ui user interface file, then touch **Update**.



CARE AND MAINTENANCE

Regular care and maintenance will keep your Delta Pro 3D printer looking and operating like new for years. The following procedures should be performed periodically.

- Clean the printer's frame with a damp, lint-free cloth, such as a microfiber cloth.
- Clean the glass build play with rubbing alcohol or another ammonia-free solvent and a soft, lint-free cloth.
- Lubricate the magnetic control arms with PTFE or lithium grease on at least a monthly basis. This can be done by applying a small amount of grease onto the magnet of the control arms, which function as a lubricant reservoir. After a few prints, wipe away any excess grease from the ball joint using a lint-free cloth.
- The carriages have been factory calibrated to ensure many thousands of hours of consistent, precision movement. If after an extended period of time they seem noisy, lubricate the wheels using silicone lubrication ONLY.
- Use a dry brush to clean the extruder gear's teeth when they become clogged or when the gear starts to slip.
- Clean the LCD touchscreen display with the printer powered off using a soft cloth. DO NOT use any solvents or cleaning fluids on the display.

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 or through email by sending a message to tech@monoprice.com. Check the website for support times and links.

SPECIFICATIONS

Model	30993, 33346
Printing Technology	Fused Filament Fabrication
Maximum Print Area	ø270 x 300 mm
Build Volume	17.16 liters
Build Platform	Heated glass
Extruder Count	1
Nozzle Diameter	0.4mm
Nozzle Material	Brass
Z-Axis Resolution	50-300 µm
XY-Axis Resolution	10 µm
Print Cooling	Two part-cooling fans
On-board Calibration	Automatic bed leveling and PID
Operating System Compatibility	Windows® 10, Mac® OS X®, Web
Supported Slicing Software	KISSlicer, Cura
Interface	Touchscreen, USB
File Format	gcode
Printing Speed	Up to 150mm/sec
Filament Diameter	1.75mm
Filament Materials	PLA, ABS, PETG, nylon, thermoplastics, metal fill, wood fill, etc.
3rd Party Filament Support	Yes
Maximum Nozzle Temperature	310°C
Maximum Build Plate Temperature	100°C
Input Power	24 VDC

AC Adapter Input Power	100 ~ 240 VAC, 50/60 Hz
Maximum Power Consumption	220 watts
Dimensions	20.7" x 20.7" x 37.0" (525 x 525 x 940 mm)
Weight	26.5 lbs. (12.0 kg)

REGULATORY COMPLIANCE

Notice for FCC



This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifying the equipment without Monoprice's authorization may result in the equipment no longer complying with FCC requirements for Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radio Notice for FCC

Caution

This FCC Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification to said product not expressly approved by Monoprice, including the use of non-approved antennas, could void the user's authority to operate this device.

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