

Pro3 Series-How to Replace the Nozzle

Tools:

- ① Needle nose pliers
- ② 8mm sleeve
- ③ Feeler gauge sets
- ④ 2.5mm hex wrench
- ⑤ Torque wrench (8mm socket)



Warning: Replacing nozzles is a complicated, and improper operation may cause filament leakage during printing. To avoid this situation, we recommend that you can replace the interchangeable hot end directly.

A. Unload the filament from the extruder

1. Unload the filament from the extruder where the nozzle needs to be replaced. While this tutorial uses the left nozzle as an example, work with whichever nozzle needs replacing on your printer.

1) Click "Utilities" on the screen to enter the printer control page.

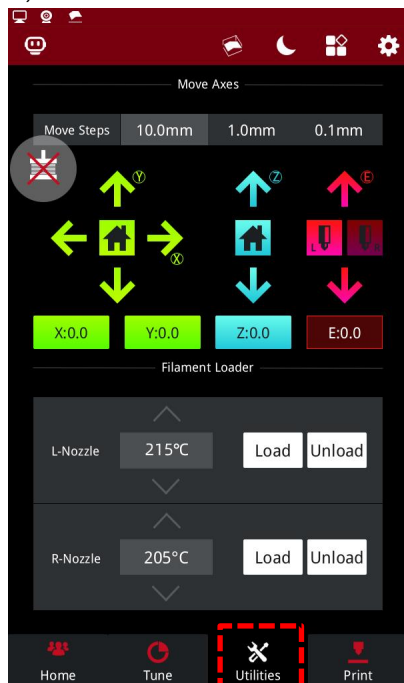


Figure 1 Enter the "Utilities" page.

2) Set the temperature of the left nozzle to the proper unloading temperature. For example, the Raise3D Premium PLA filament is loaded in the left nozzle and its default loading temperature is 215°C. In our demonstration, we set the left nozzle temperature to 215°C.

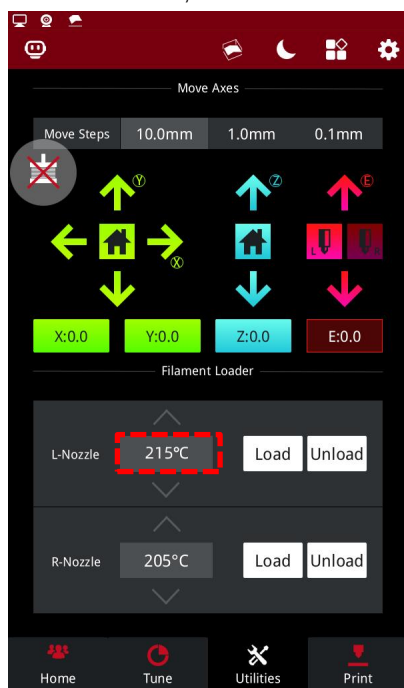
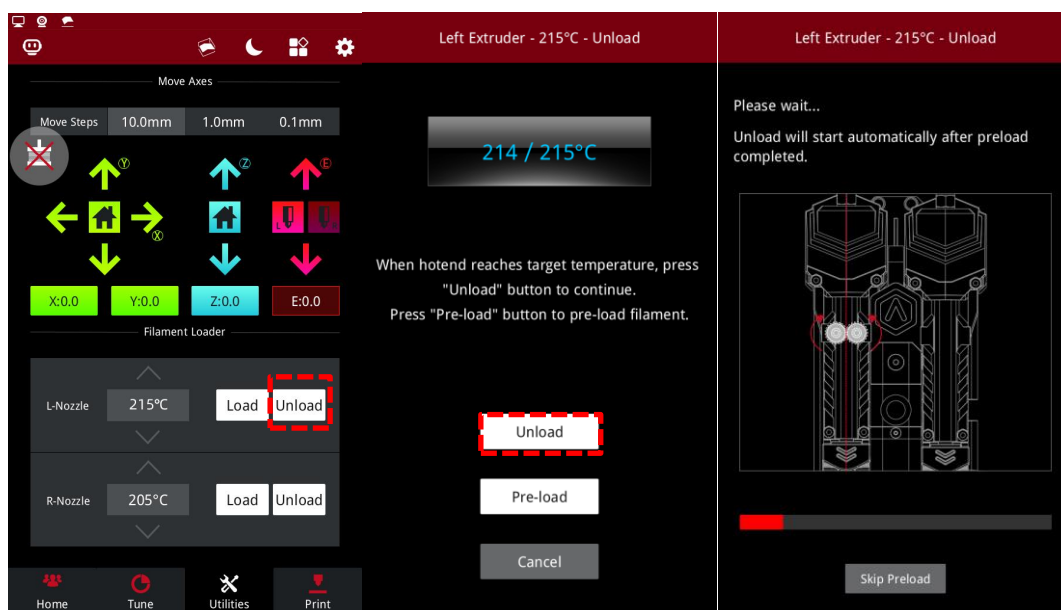


Figure 2 Set the temperature of the left nozzle.

3) Click the "Unload" button, and the printer will automatically begin to heat. When the printer reaches the targeted temperature, click "Load". The extruder will pre-extrude the remaining filament in the extruder and begin to unload the filament.

**Figure 3 Unload the filament.**

4) Press and hold the metal quick connector on the extruder with your hand and pull the filament guide tube out of the extruder.

**Figure 4 Pull the filament guide tube out.**

5) Gently pull the filaments out of the extruder. When all the filament is removed from the extruder, click "OK" on the screen to end the unloading.

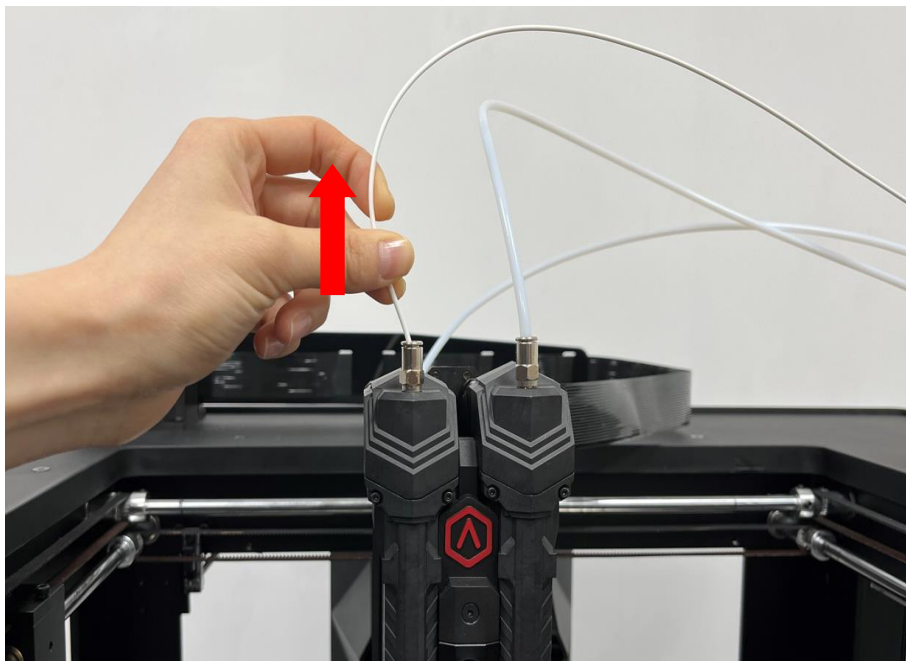


Figure 5 Pull out the filament.

B. Adjust the position of the build plate and the extruders

1. Enter the “Utilities” page, and click the “Disable Motor” button to disable the motor. Now you can manually move the extruder to the proper position.

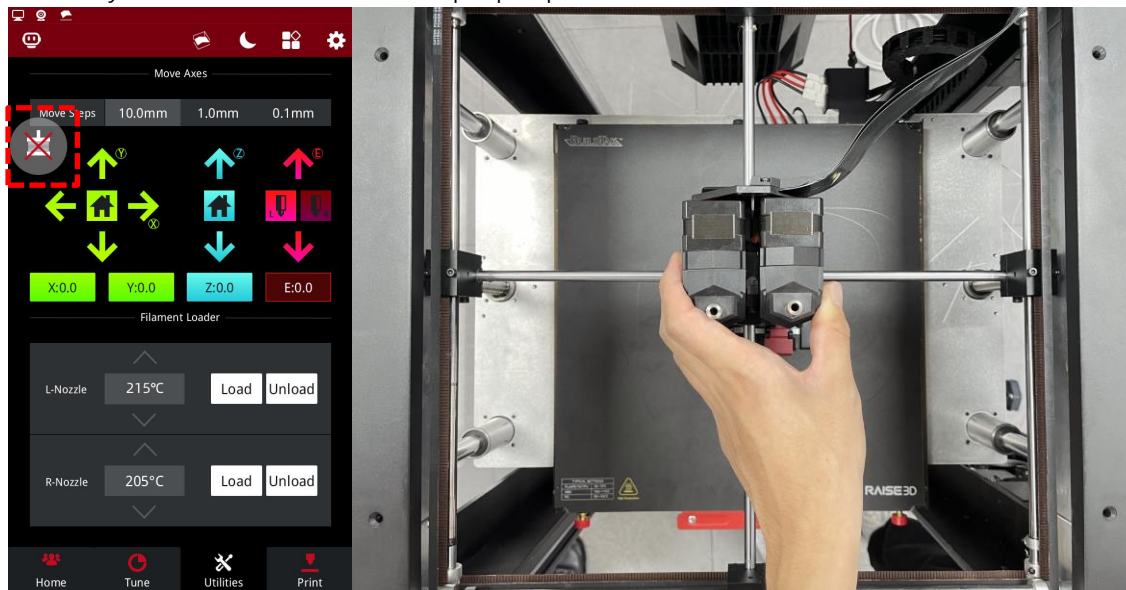


Figure 6 Click “Disable the motor”.

2. Select the Z-axis, then click the up and down arrows to move the build plate to a position suitable for working.

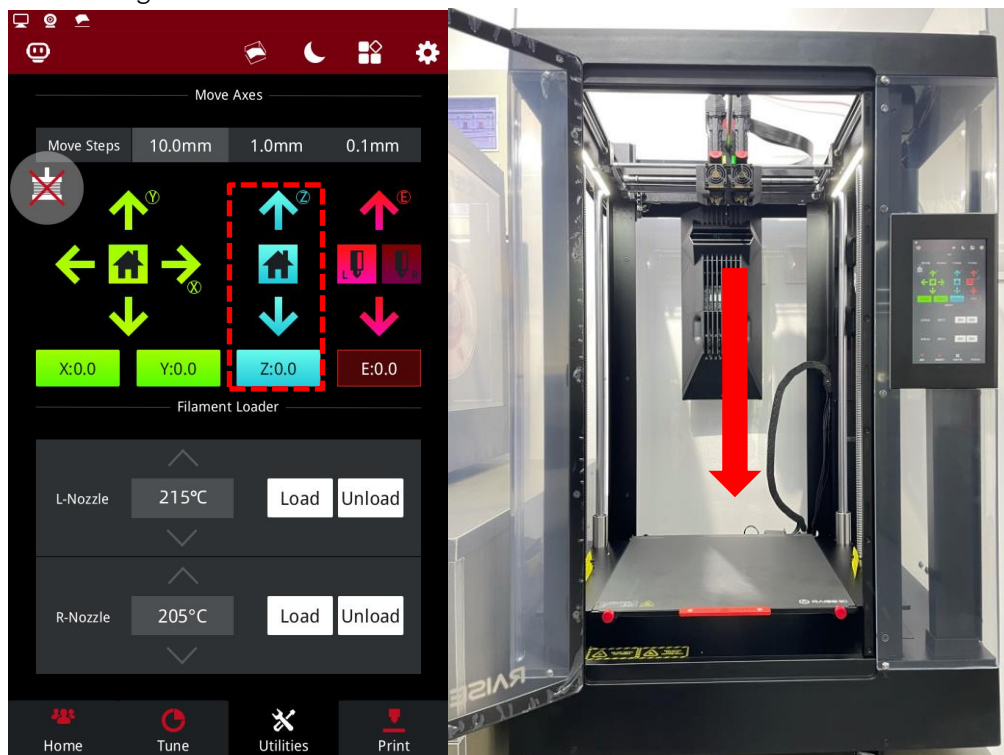


Figure 7 Adjust the height of the build plate.

C. Remove the old nozzle

1. In order to remove the nozzle smoothly, first heat the left nozzle to 180°C-200°C.

1) Select the left nozzle icon on the home page, set the left nozzle temperature to 180°C, and wait for the left nozzle temperature to rise to the specified temperature.

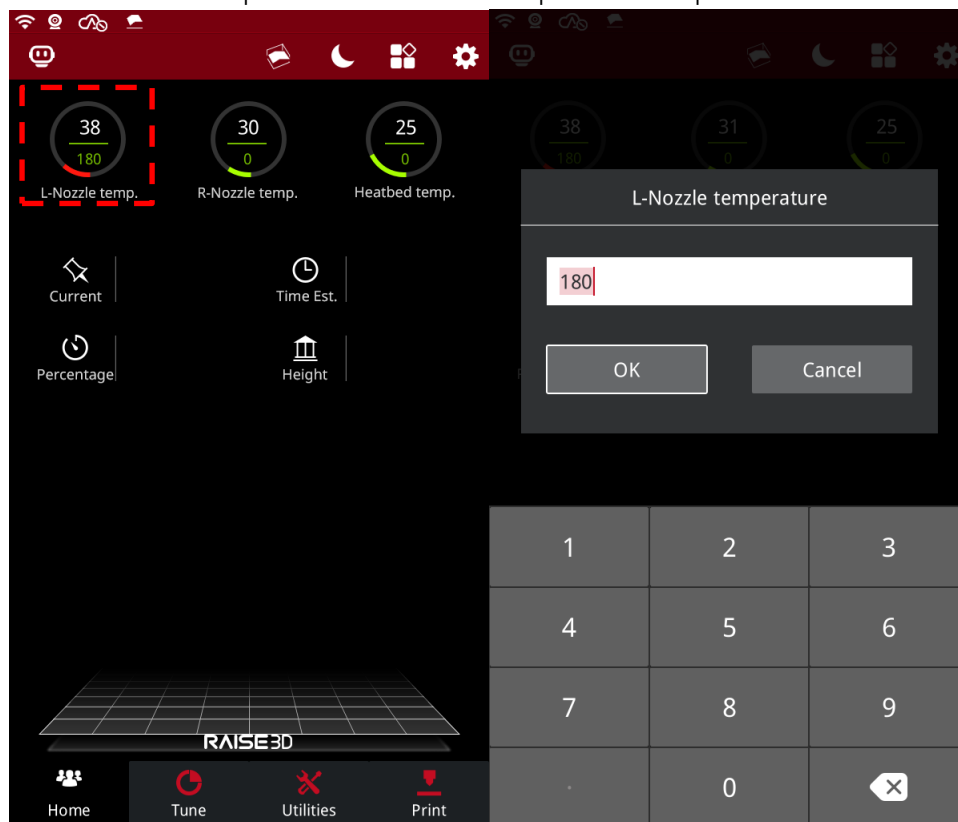


Figure 8 Heat the left nozzle.

2) When the temperature of the left nozzle rises to the specified temperature, turn off the power of the printer.

Note: Do not work on the printer with the power on to avoid personal injury and causing damage to the printer.



Figure 9 Turn off the printer power.

2. You can use a 2.5mm hex wrench to loosen the 4 screws on the model cooling fan and move the fan away.

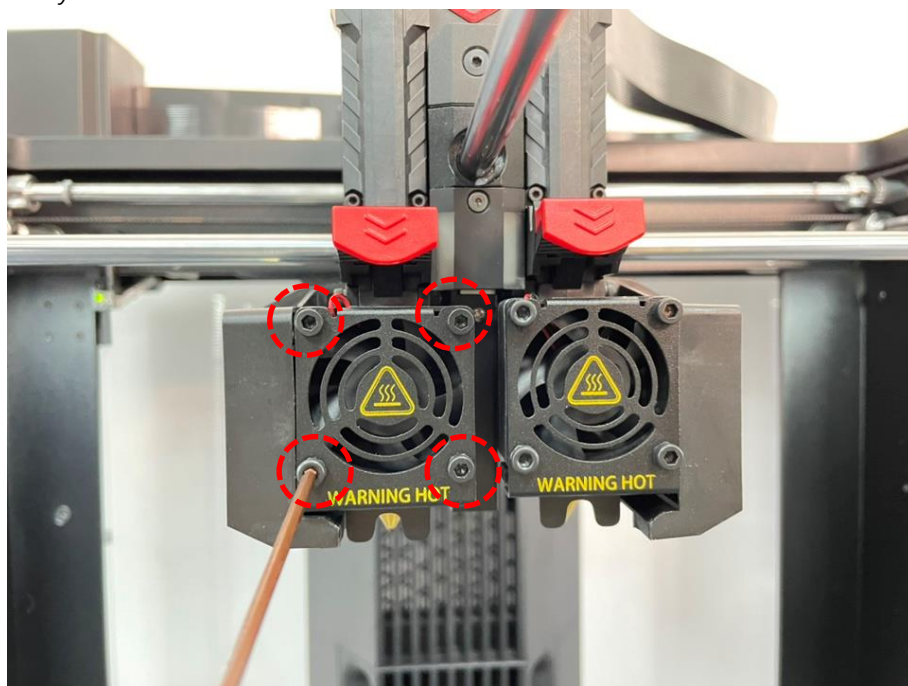


Figure 10 Remove the model cooling fan.

3. Hold the heating block with needle-nose pliers to prevent the heating block from moving. Then cover the left nozzle with an 8mm sleeve. Turn the sleeve clockwise to loosen the nozzle with the sleeve.

Note: Remember, the heating block and nozzle are hot, be careful of burns.

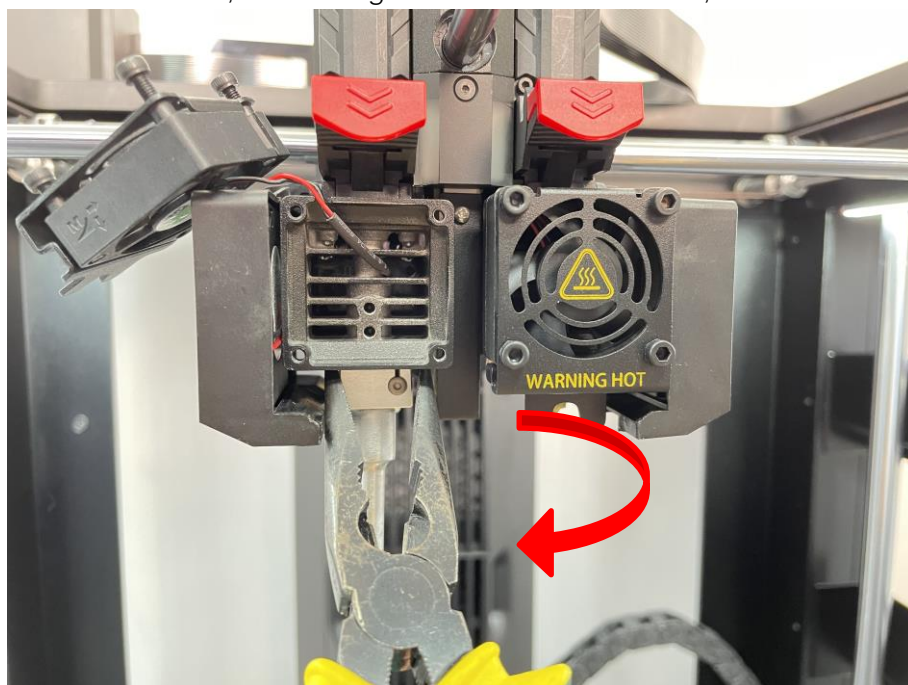


Figure 11 Loosen the nozzle with the sleeve.

4. Continue to turn the sleeve clockwise to remove the nozzle. Hold the removed nozzle carefully to avoid burns because it is very hot.

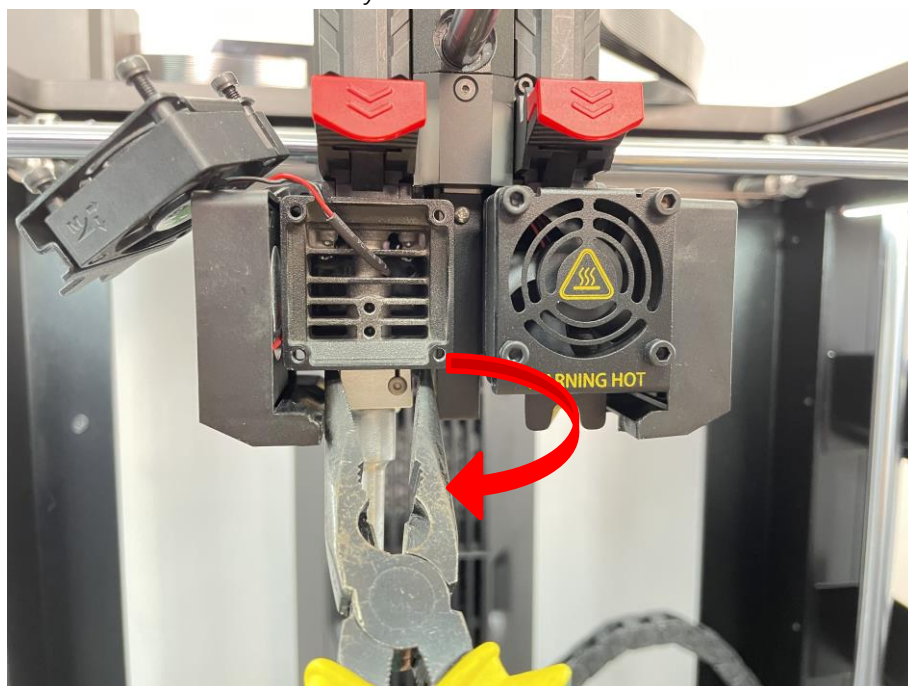


Figure 12 Continue to loosen the nozzle with the sleeve.

D. Install a new nozzle

1. Prepare a new nozzle.



Figure 13 Prepare a new nozzle.

2. Select the left nozzle icon on the home page, set the left nozzle temperature to 180°C, and wait for the left nozzle temperature to rise to the specified temperature.

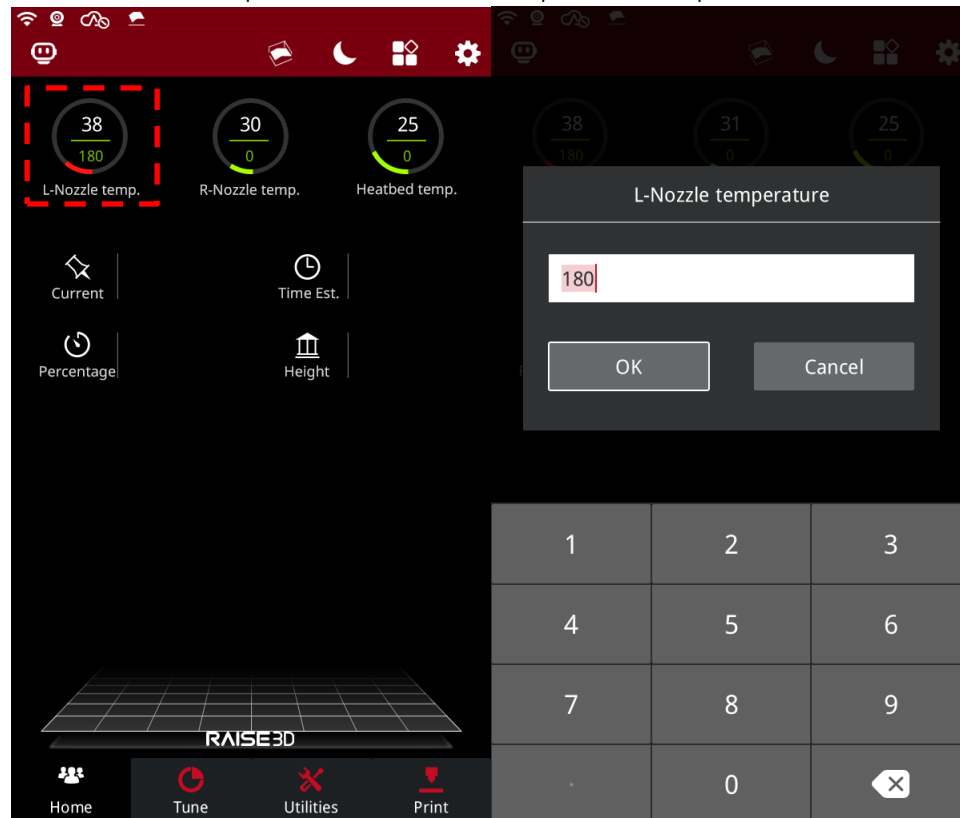


Figure 14 Heat the left nozzle.

3. When the temperature of the left nozzle rises to the specified temperature, turn off the power of the printer.

Note: Do not work on the printer with the power on to avoid personal injury and causing damage to the printer.



Figure 15 Turn off the printer power.

4. Use the sleeve to screw the nozzle into its original position on the heating block.

Note: At this point the temperature of the heating block is still very high, be careful of burns.

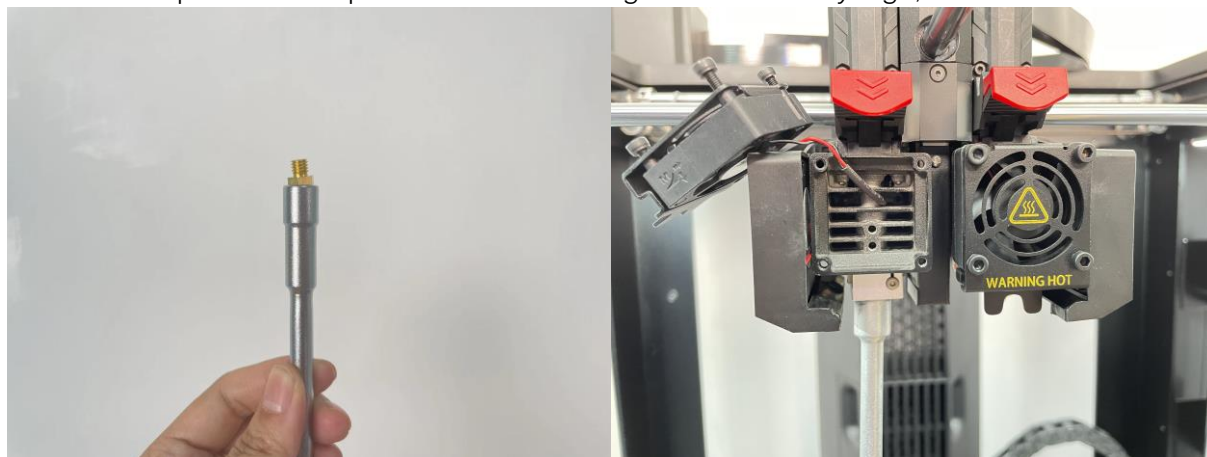


Figure 16 Install the new nozzle.

5. Hold the heating block with needle nose pliers to prevent the heating block from moving. Using a **torque wrench (8mm socket)**, set it to **$39\pm 1\text{kgf/cm}$ (about 3.9N.m)**. Turn the torque wrench counterclockwise evenly at until the nozzle is tightened.

⚠ Warning

1. When using needle-nose pliers to hold the heating block, be careful not to damage the heating block with the needle-nose pliers.
2. Be sure to use a **torque wrench**, set it to **$39\pm 1\text{kgf/cm}$ (about 3.9N.m)**. Evenly and slowly turn the nozzle counterclockwise, until you hear a "click" (the predetermined torque value has been reached), stop turning the nozzle.

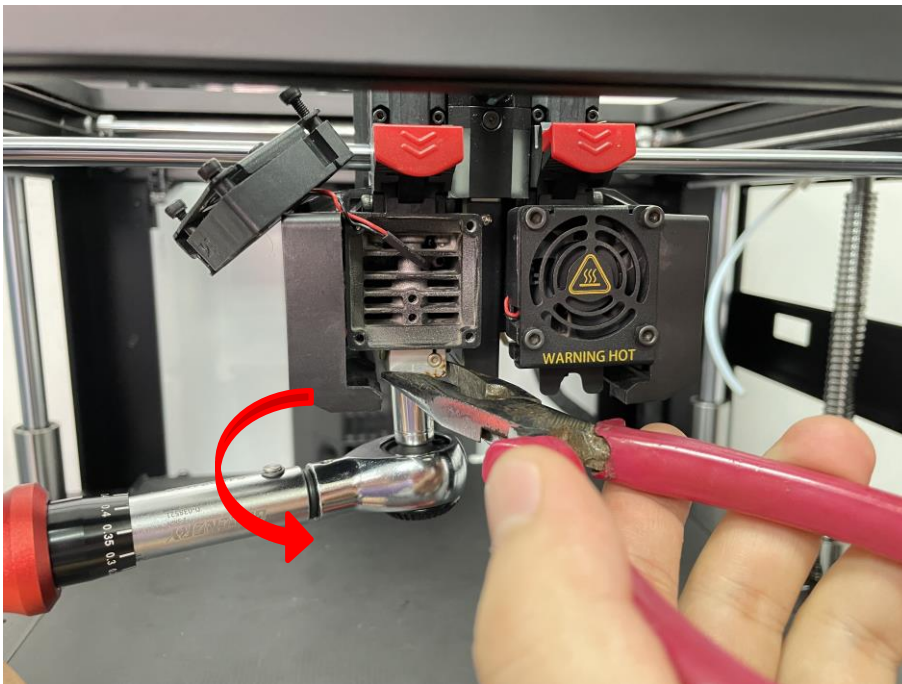


Figure 17 Firmly turn the sleeve to tighten the nozzle.

6. Ensure that there is a spacing of **$0.1\text{mm}-0.6\text{mm}$** between the nozzle and the heating block after turning the nozzle.

⚠ Warning

A distance of **0.1mm MUST** be reserved between the nozzle and the heating block. If it is not suitable, it may cause material leakage during the printing process.

- 1) A distance of 0.1mm **must** be reserved between the nozzle and the heating block. Plug a 0.1mm feeler gauge between the nozzle and the heating block first, to test that the 0.1mm feeler gauge can be inserted into the gap. If the 0.1mm feeler gauge cannot be inserted into the gap, the nozzle is over-tightened. Please consult Raise3D after-sales support for assistance.

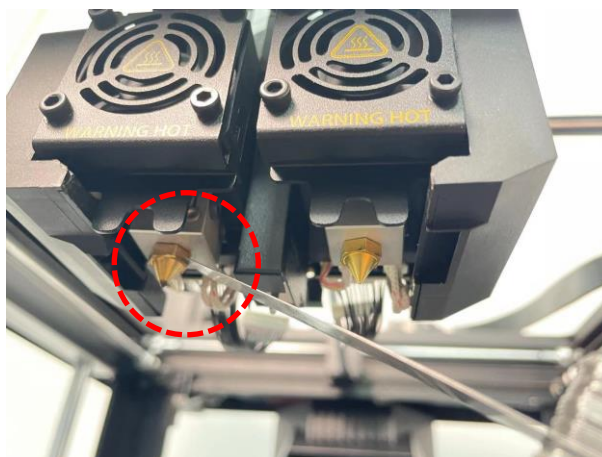


Figure 18 Check the spacing between the nozzle and the heater block with a feeler gauge.

2) A reasonable spacing between the nozzle and the heating block is 0.1mm-0.6mm. After you have confirmed that there is a 0.1mm space between the nozzle and the heating block, continue checking the spacing with a feeler gauge $\leq 0.6\text{mm}$.

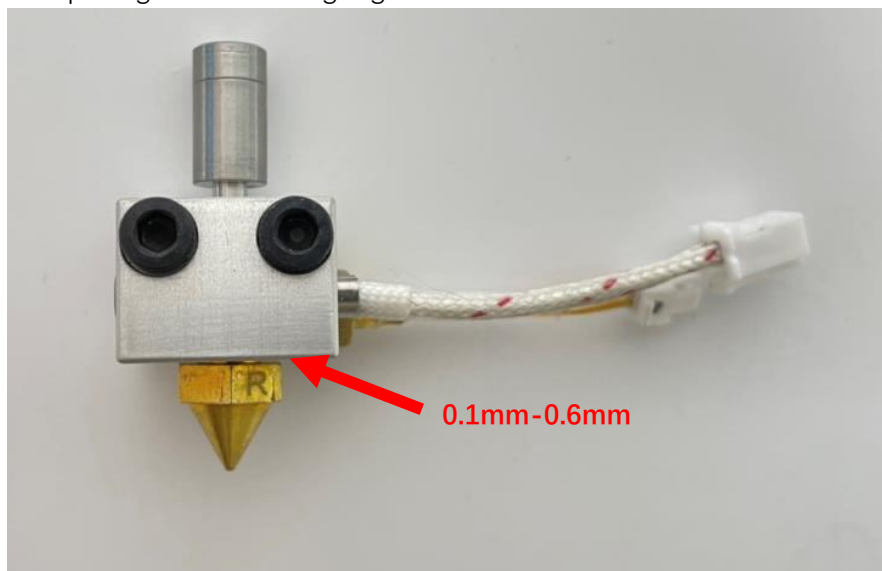


Figure 18 The reasonable spacing.

7. Use a 2.5mm hex wrench to screw back the 4 securing screws and install the fan back to its original position.

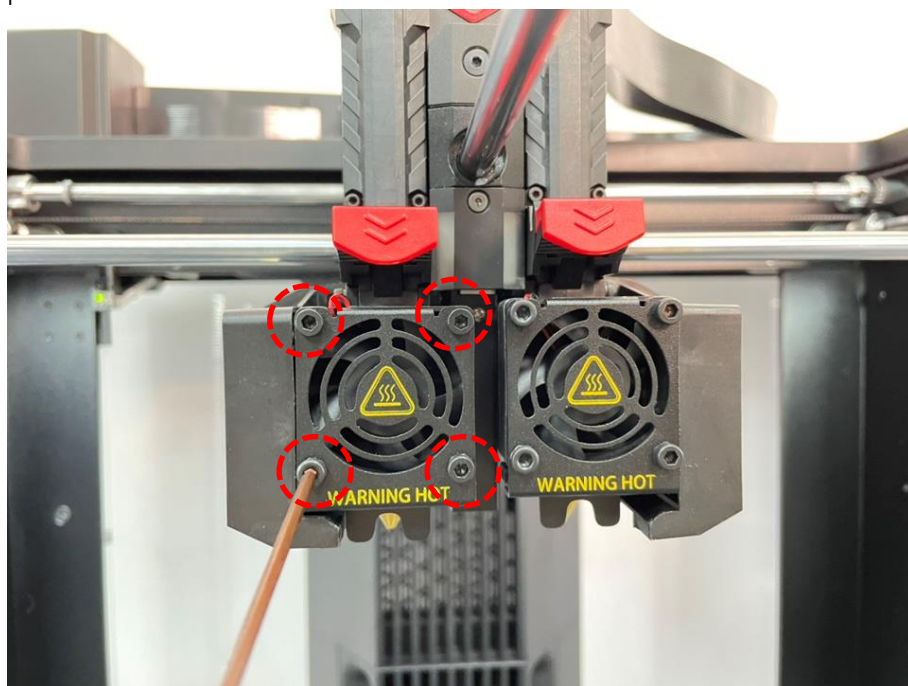


Figure 19 Install the screws on the model cooling fan.

Note: When installing the fan, the connecting cable of the fan needs to be locked in the slot to avoid short circuiting.

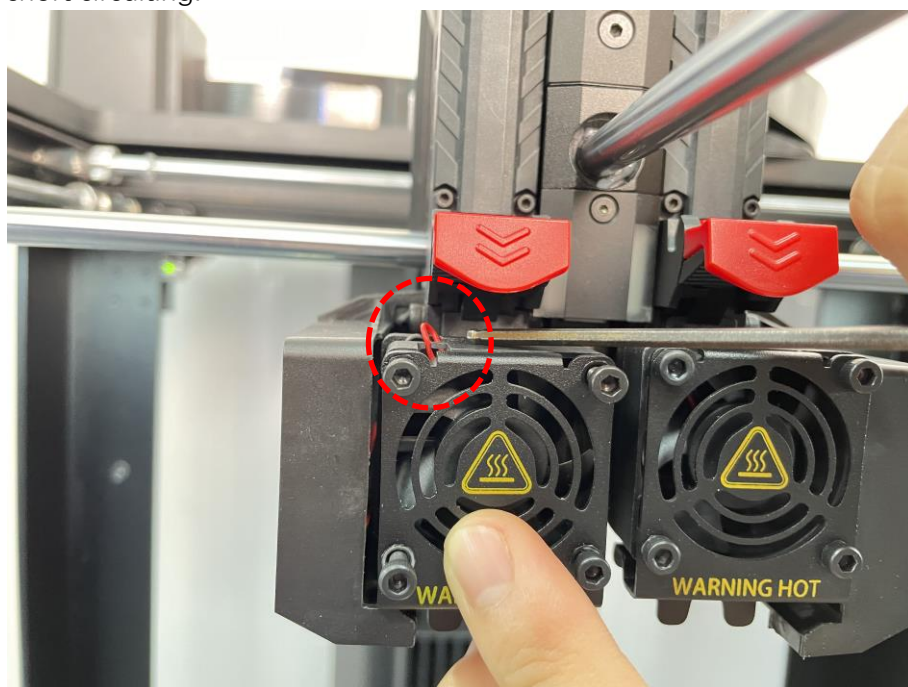


Figure 20 Install the fan.

E. Run the Offset Calibration

1. When the new nozzle is installed, run the 5-step Offset Calibration to calibrate the nozzle and check the nozzle for potential leaks.
2. Make sure the printer has 2 spools of Raise3D Premium PLA filament loaded and that it can extrude the filament normally. Refer to the [Pro3 Series-How to load and unload filament-V1.0](#) in the Support Center.
3. Click the "Settings" icon in the upper left corner to enter the settings interface.

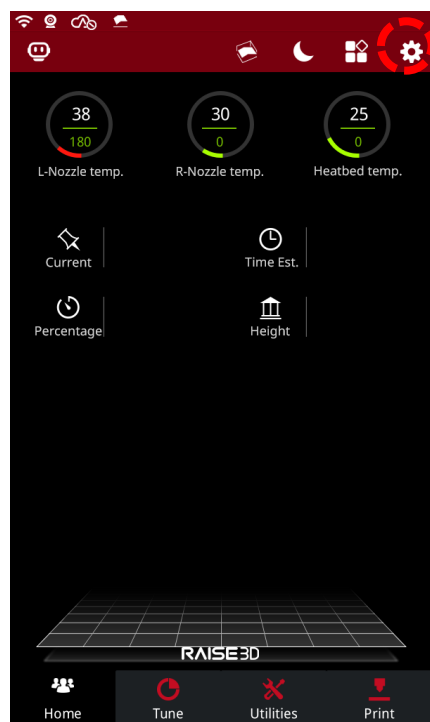


Figure 21 Enter the setting interface.

4. Select "Maintenance" on the "Machine" tab.

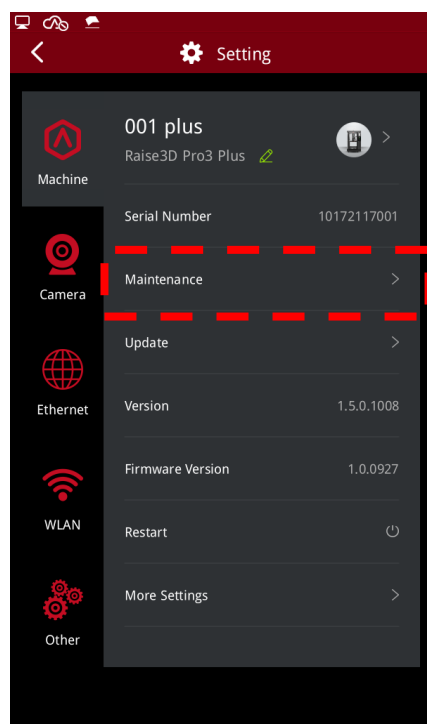


Figure 22 Enter the Maintenance interface.

5. Select "Offset Calibration".

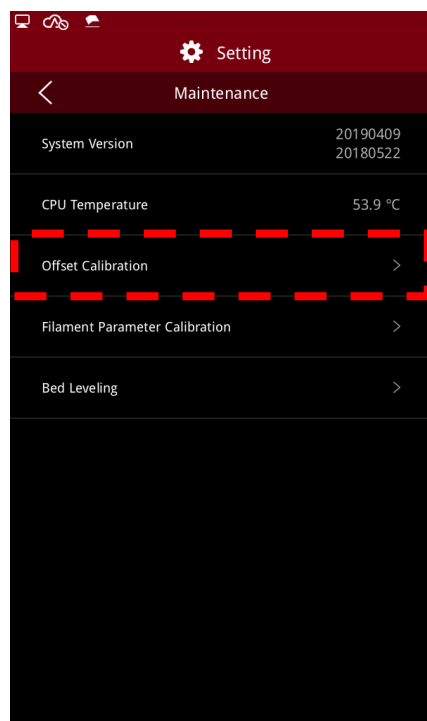


Figure 23 Enter the Offset Calibration.

6. Make sure the printer meets all the requirements on the screen, and then click "Start".

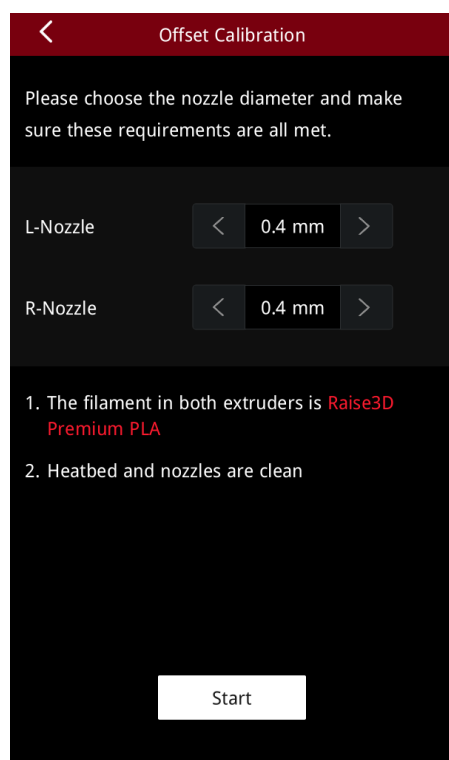


Figure 24 Confirm the requirements.

7. You will enter the 5-step Offset Calibration interface, run each step in turn.

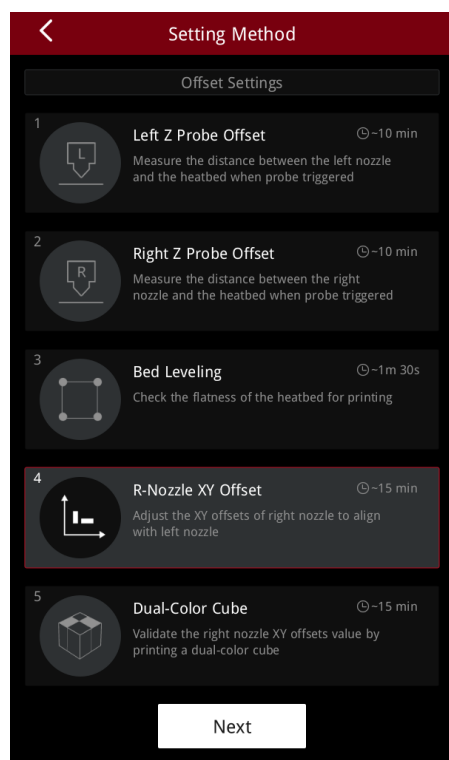


Figure 25 Run the 5-step Offset Calibration.

8. Check whether the nozzle leaks during printing. If the nozzle leaks, reinstall the nozzle following the steps in this tutorial or contact Raise3D after-sales support.

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