

BIGTREETECH Universal Turbo Kit (WS7040-24-V200)

BIGTREETECH Universal Turbo Kit WS7040-24-V200 Instruction Manual

1. INTRODUCTION AND OVERVIEW

The BIGTREETECH Universal Turbo Kit WS7040-24-V200 is a high-performance brushless centrifugal air blower designed for 3D printers such as Voron2.4, VzBot, and HevORT. This kit provides superior cooling for high-speed printing, enhancing print quality and efficiency.

Key features include:

- **Optimized Performance:** Equipped with an adapter board, the circuit design is optimized to fully utilize the brushless drive's power, resulting in a 15% improvement in air volume compared to direct Raspberry Pi connections.
- **Easy Connectivity:** The adapter board facilitates direct connection to 5-24V fan interfaces, allowing for straightforward replacement of DC fans without complex configuration.
- **Convenient Wiring:** Features quick-connect terminals for easy and fast wiring. A 2-meter wire is included, allowing for custom cutting and routing based on your printer's layout.
- **Voron2.4 Compatibility:** Includes a complete set of installation printing files and screws specifically designed for Voron2.4, ensuring a smooth setup experience.
- **Enhanced Durability:** Comes with a mushroom-head air filter for dust and noise reduction, contributing to an extended fan lifespan.
- **Powerful Specifications:** Delivers 6.5KPA wind pressure, 45000 RPM speed, and 14.7CFM air volume for effective cooling.

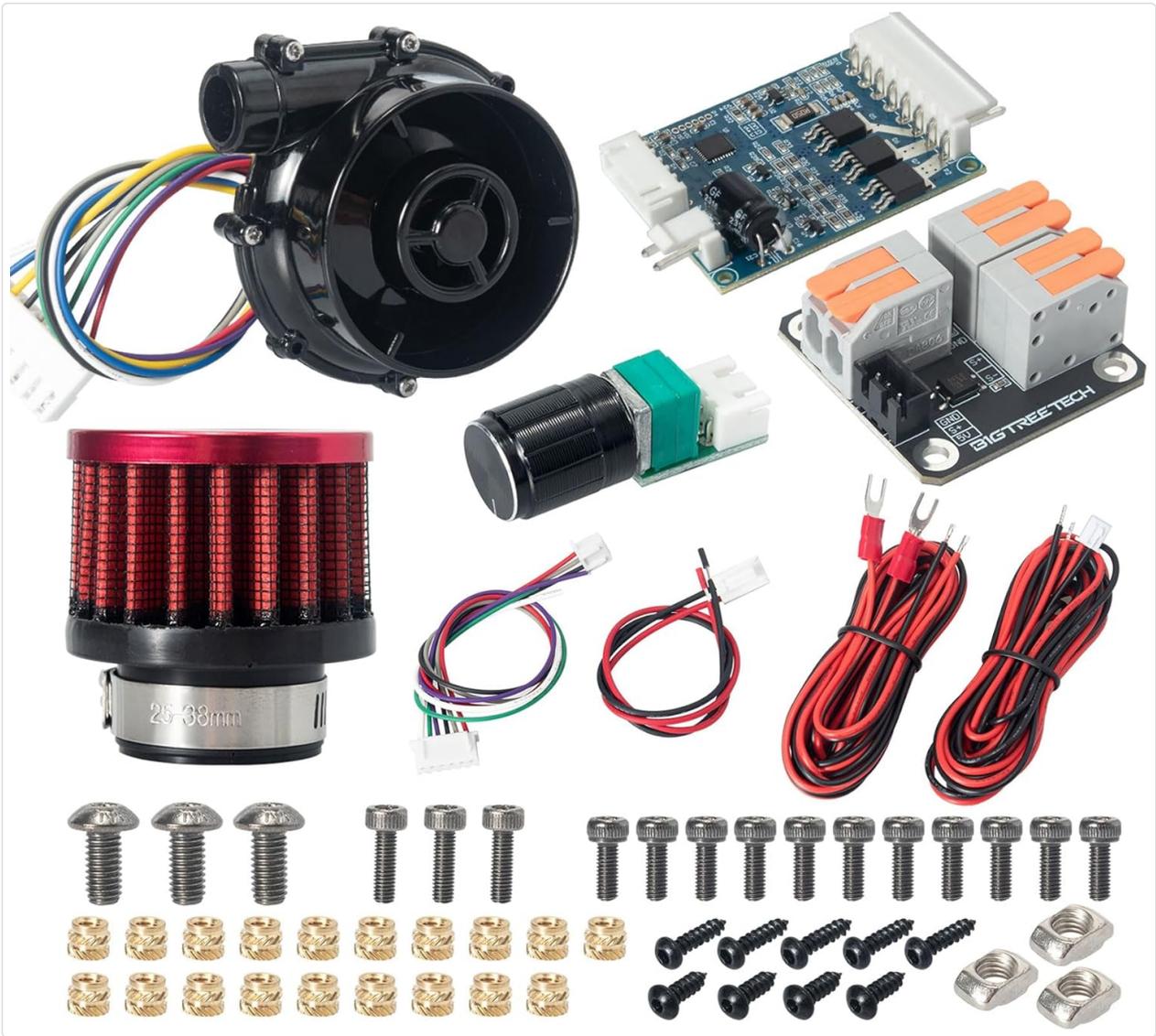
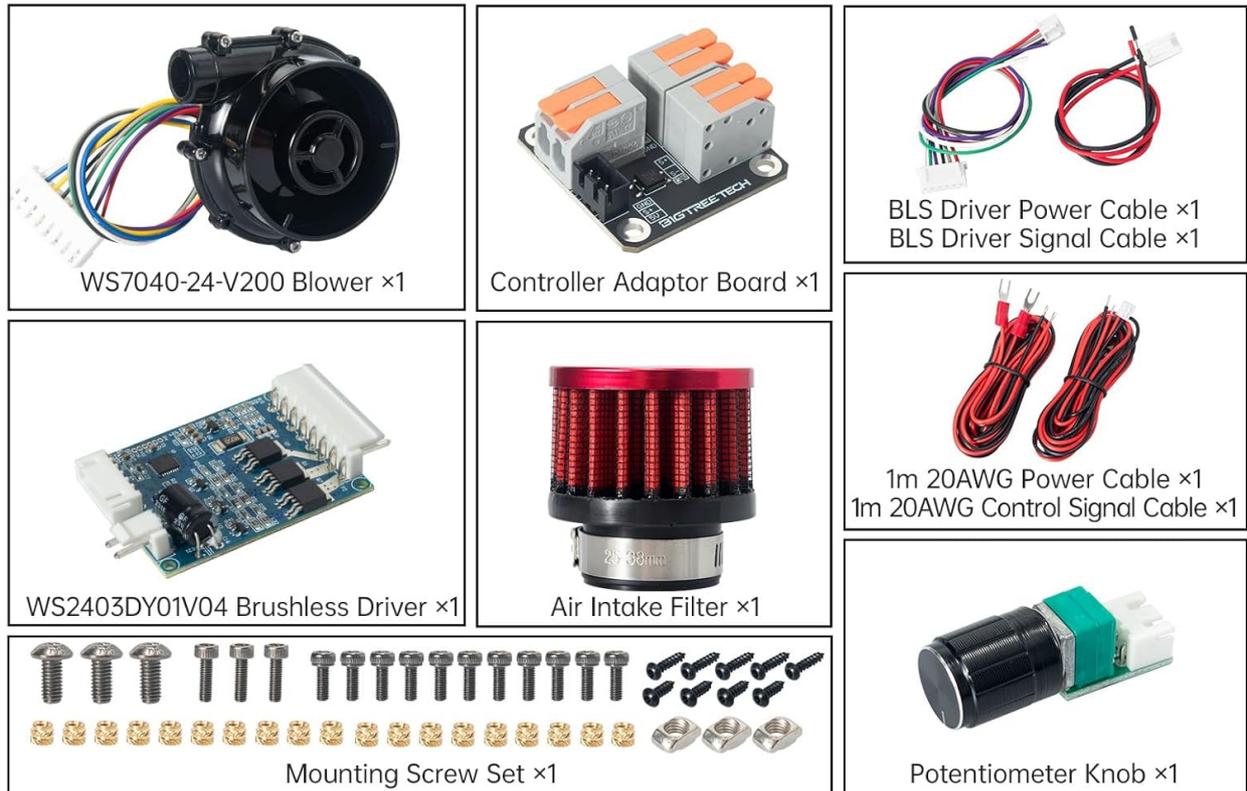


Image 1.1: Overview of the BIGTREETECH Universal Turbo Kit.

2. PACKAGE CONTENTS

Before beginning installation, please verify that all components listed below are present in your package:

What's in the Box?



Technical Specifications

Product Name	Universal Turbo Kit
Voltage	24V
Power	60W
Control Signal	5-24V PWM (Universal)
Max Pressure	6.5 kPa
Max RPM	45,000
Max Flowrate	14.7 CFM (25m ³ /h)

Image 2.1: Detailed view of the kit contents and technical specifications.

- WS7040-24-V200 Blower x1
- Controller Adapter Board x1
- BLS Driver Power Cable x1
- BLS Driver Signal Cable x1
- 1m 20AWG Power Cable x1
- 1m 20AWG Control Signal Cable x1
- WS2403DY01V04 Brushless Driver x1
- Air Intake Filter x1
- Mounting Screw Set x1
- Potentiometer Knob x1

Additionally, the kit includes various hardware components such as heatset inserts, M2.6 self-tapping screws, M5 T-nuts, and M3*8 screws for assembly.

3. SETUP AND INSTALLATION

This section provides step-by-step instructions for installing your BIGTREETECH Universal Turbo Kit. For a

visual guide, please refer to the official installation video below.

Your browser does not support the video tag.

Video 3.1: Official installation tutorial for the BIGTREETECH Universal Turbo Kit on Voron Printers.

3.1. Preparing Printed Parts and Hardware

1. **Embed Heatset Inserts:** A total of 14 heatset inserts must be embedded into the designated locations on the printed housing parts. Ensure they are flush and secure.

Self-Developed Customized Adapter Board

Our plug-and-play adapter board with quick-connect terminals makes installation a breeze. No complex wiring or Raspberry-Pi connections required, directly connect to 5-24V fan interface for quick replacement of DC fans.

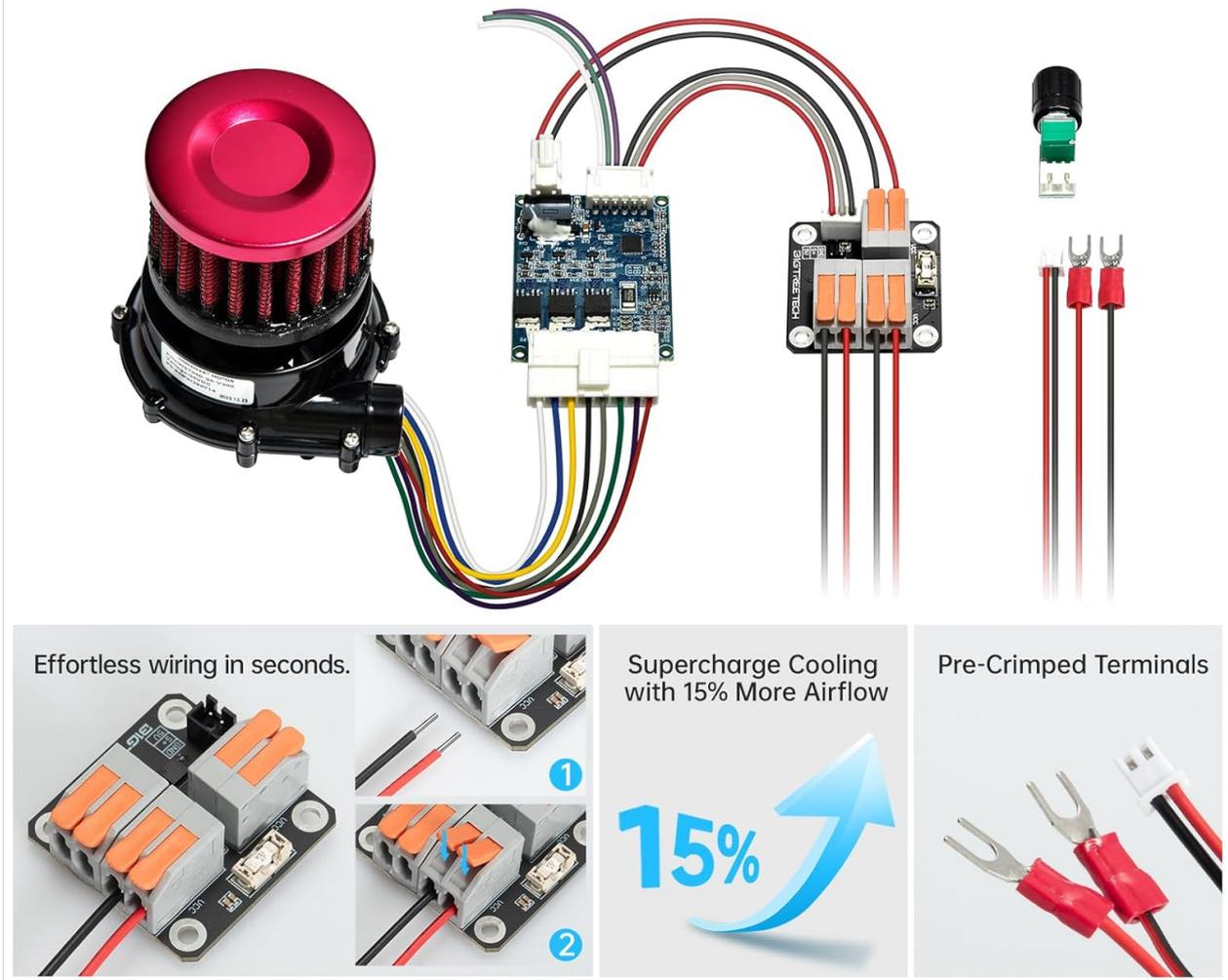


Image 3.1: The customized adapter board and various wiring components, including quick-connect terminals.

3.2. Assembling the Main Housing

2. **Install Filament Runout Sensor (Optional):** If using, install the SFS 2.0 filament runout sensor module into its respective place within the housing. Secure it with three M3*8 screws.
3. **Connect CPAP Tubing to Blower:** Cut off the rubber sleeve from the CPAP tubing and connect it securely to the blower.
4. **Route Cables:** Carefully run both the blower cable and the SFS cable (if applicable) through the cable management cutout in the housing.
5. **Install Backplate:** Attach the backplate to the housing using M3x10 screws. Secure the blower with three M2.6 screws.

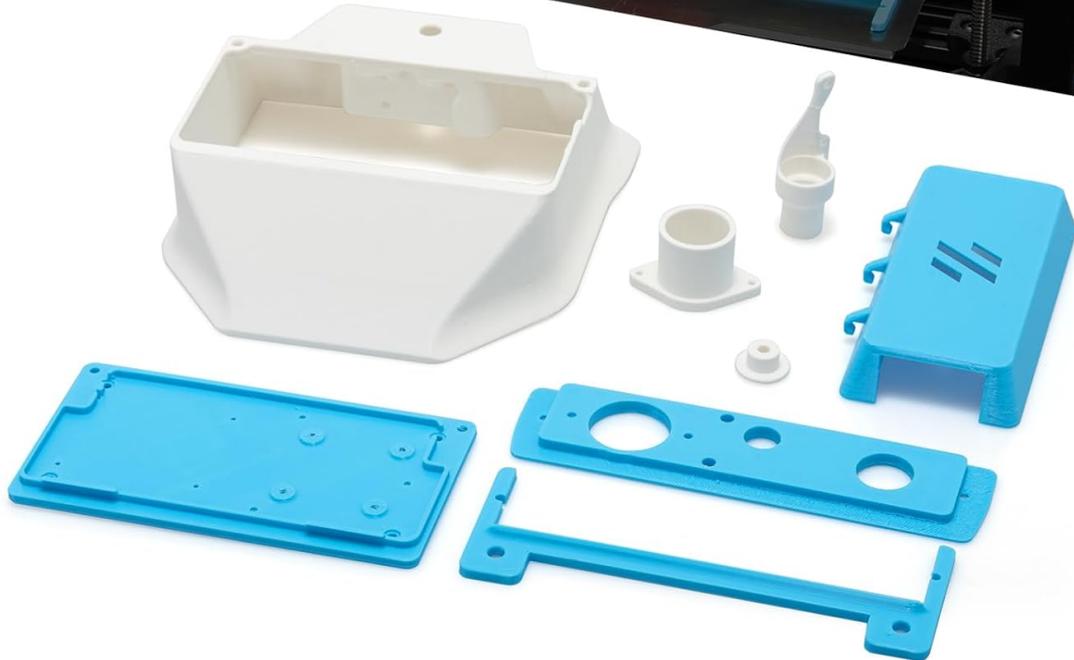
6. **Install BLDC Driver and Adapter Board:** Install the BLDC driver and the adapter board into the housing. Secure them with four M2 and M3*8 screws respectively.
7. **Connect Wires:** Connect the BLDC driver power cable to the adapter board. Plug the 3-pin XH2.54 connector into the potentiometer. Cut the included power and signal cables to your preferred length and connect them to the adapter board. Connect the power to 24V DC. Connect the signal cable to any fan port (3.3-24V full range compatibility). **Caution: Be careful not to reverse the positive and negative terminals during wiring.**
8. **Connect to Mainboard:** Connect the power cable to the fan interface of your mainboard. The voltage can be selected as 5V/12V/24V depending on your mainboard's capabilities.
9. **Install Backcover:** Install and secure the backcover with four M3*8 screws.

3.3. Air Intake and Mounting

10. **Secure Air Intake Filter Adapter:** Secure the Air Intake Filter adapter with two M3*8 screws.
11. **Pass Air Duct:** Pass the air duct through the printed part and secure it with two M3*8 screws.
12. **Mount to Extrusion:** Loosen the screws on the printer's extrusion to make installation easier, then tighten them after positioning the assembly. Use two M5*10 screws and T-nuts to secure the assembly to the extrusion.
13. **Install Knomi V2 (Optional):** If using, insert the Knomi V2 into its designated slot. Secure the tube adapter with two M3*8 screws to keep the Knomi in position.
14. **Secure EBB SB CAN Toolboard (Optional):** If using, secure the BIGTREETECH EBB SB CAN toolboard using two M3*8 screws.
15. **Install Stealthburner:** Install the Stealthburner onto the printer.
16. **Measure and Cut CPAP Hose:** Move the print head to its farthest distance on the axis and measure the required length of the CPAP hose. Cut it to the appropriate length, leaving an extra 2-5cm for flexibility.
17. **Secure Hose:** Use cable ties to secure the CPAP hose in place.
18. **Insert PTFE Tube:** Insert the PTFE tube into the printed part.

Instant Setup with Voron 2.4 Files & Screws

Includes a complete set of installation print files and screws for Voron 2.4, streamlining your setup for a smooth experience.



*Please download the files from: <https://bttwiki.com/Universal%20Turbo%20Kit.html>

Image 3.2: The kit includes installation files and screws for Voron 2.4 compatibility.

4. OPERATING INSTRUCTIONS

The BIGTREETECH Universal Turbo Kit is designed for seamless integration with your 3D printer's control system. Once installed and wired correctly, the blower's speed can be controlled via a 5-24V PWM signal.

- **Manual Speed Control:** Utilize the included potentiometer knob by connecting its 3-pin XH2.54 connector to the potentiometer for manual adjustment of the blower speed.
- **Firmware Speed Control:** For advanced control, connect the signal cable to a fan port on your mainboard or Raspberry Pi (SBC). This allows for speed control through your printer's firmware, enabling precise airflow adjustments during printing. Refer to your printer's specific documentation for fan control settings.

Powerful Airflow

Unleash superior cooling for flawless high-speed printing!

45,000_{RPM}

Traditional 5015 Fan

8500 maximum RPM

BIQU Universal Turbo Kit

45,000 maximum RPM

Image 4.1: The blower provides powerful airflow up to 45,000 RPM for efficient cooling.

5. MAINTENANCE

Regular maintenance ensures optimal performance and extends the lifespan of your Universal Turbo Kit.

- **Air Filter Cleaning:** The mushroom-head air filter is crucial for preventing dust and filament particles from entering the blower. Periodically inspect and clean the air filter to maintain optimal airflow and prevent blockages. Depending on your printing environment and material usage, cleaning frequency may vary.
- **General Inspection:** Regularly check all wiring connections to ensure they are secure. Inspect the CPAP tubing for any signs of wear or damage.

Extend Fan Life with Air Intake Filter

Equipped with an air filter to prolong turbo lifespan, reduce noise, and effectively filter out large filament particles.

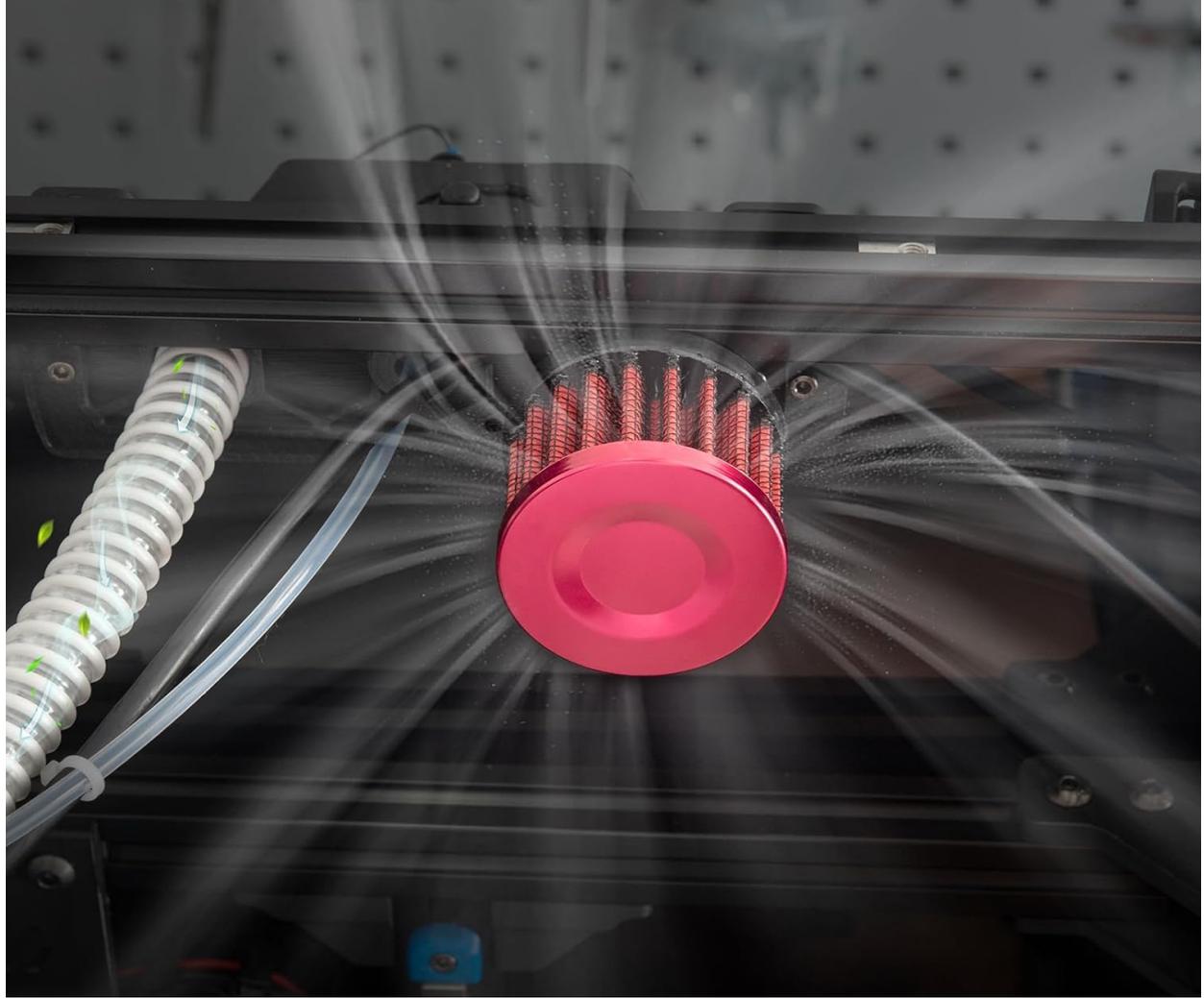


Image 5.1: The air intake filter helps prolong the turbo's lifespan by reducing dust and noise.

6. TROUBLESHOOTING

If you encounter issues with your Universal Turbo Kit, consider the following troubleshooting steps:

- **No Power/Fan Not Spinning:**

- Verify all power connections are secure and correctly polarized (positive to positive, negative to negative).
- Ensure the mainboard's fan port is supplying the correct voltage (5V/12V/24V) and is enabled in the firmware.
- Check the potentiometer knob (if used) is not set to minimum speed.

- **Insufficient Airflow:**

- Inspect the air intake filter for clogs and clean if necessary.
- Ensure the CPAP tubing and air duct are free from obstructions or kinks.
- Verify the blower speed setting (manual or firmware) is at the desired level.

- **Unusual Noise:**

- Check for any loose components or screws within the housing.
- Ensure the blower is securely mounted and not vibrating against other parts of the printer.

For further assistance, please contact BIGTREETECH customer support or consult online community forums for your specific 3D printer model.

7. SPECIFICATIONS

Detailed technical specifications for the BIGTREETECH Universal Turbo Kit WS7040-24-V200:

Feature	Specification
Product Name	Universal Turbo Kit
Voltage	24V
Power	60W
Control Signal	5-24V PWM (Universal)
Max Pressure	6.5 KPA
Max RPM	45,000
Max Flowrate	14.7 CFM (25m ³ /h)
Item Weight	13.4 ounces
Package Dimensions	7.17 x 3.46 x 3.39 inches
Material	Plastic

8. WARRANTY AND SUPPORT

This BIGTREETECH product is covered by the manufacturer's standard warranty. Please retain your proof of purchase for any warranty claims. For specific warranty terms and conditions, refer to the documentation included with your product or visit the official BIGTREETECH website.

For technical support, product inquiries, or to explore other BIGTREETECH products, please visit the official BIGTREETECH Store:

[Visit the BIGTREETECH Store on Amazon](#)