POLISI3D CHC Pro Hotend (CHC-V6)

POLISI3D CHC Pro Hotend User Manual

Model: CHC Pro Hotend (CHC-V6)

1. Introduction and Overview

This manual provides essential information for the installation, operation, and maintenance of your new hotend. Please read it carefully before use.

2. Package Contents

Verify that all components listed below are present in your package:

- 1x Aluminum heatsink with buckles
- 1x Bimetal heatbreak
- 1x Heater block installed with ceramic heater and thermistor
- 1x Brass nozzle 0.4mm
- 1x Silicone cover (sock)
- 2x Cables (Heater and Thermistor extension cables)
- Accessories bag (includes wrench, hex key)

Figure 2.1: Exploded view of the CHC Pro Hotend components, including the V6 heat sink, bi-metal heatbreak, volcanic heatblock, V6 volcanic nozzle, silicone sock, heater extension cable, thermistor extension cable, and accessories bag.

3. Key Features

- **Power:** 24V 115W for rapid heating.
- **High Temperature Capability:** Designed for long-term printing up to 300°C, with a thermistor capable of sensing up to 320°C.
- **Accurate Temperature Reading:** Thermistor directly installed in the block for precise temperature monitoring.
- **Bimetal Heatbreak:** Features a copper alloy and Titanium Alloy TC4 construction for efficient heat dissipation and reduced heat creep. Inner wall roughness Ra0.4.
- **Ceramic Heating Ring:** Built-in copper plated heating loop ensures uniform and fast heating, reaching 360°C loop heating (though printing temperature should remain below 300°C for longevity).

Figure 3.1: Detailed view of the heatbreak and heatblock, highlighting the 0.25mm thickness, Ra0.4 inner wall roughness, and M6 smooth threads.

Figure 3.2: Illustration of the Volcanic Ceramic heating block kit, emphasizing 360° loop heating, fast temperature heating, high accuracy, and ease of replacement.

Figure 3.3: Depiction of the ceramic heating ring with built-in copper plated heating loop, showing uniform and rapid heating up to 360° loop heating, and the integrated NTC 100K B3950 thermistor.

Figure 3.4: Performance graph illustrating the rapid temperature increase of the high temperature resistant ceramic circle ring, reaching 280°C in approximately 20 seconds and 320°C in 51 seconds.

4. Setup and Installation

This hotend is designed to be compatible with V6 Volcano Hot Ends and similar systems. Installation typically involves replacing your existing hotend assembly.

4.1 Wiring Connections

Ensure correct wiring for the heater cartridge and thermistor. The heater cartridge line is 165mm and the thermistor line is 145mm. The connectors are Micro-Fit 3.0 for the heater and XH 2.54 for the thermistor.

Figure 4.1: Cable lengths and connector types for the heater cartridge (Micro-Fit 3.0, 165mm) and thermistor (XH 2.54, 145mm).

4.2 Firmware Configuration

It is crucial to update your 3D printer's firmware to correctly recognize the new thermistor type and handle the higher power output. Failure to do so can lead to inaccurate temperature readings, thermal runaway, and potential damage to your printer.

For **Klipper firmware**, you will need to modify the `sensor_type` in your `extruder` configuration. The thermistor used is NTC100K B3950. An example configuration might look like:

```
[extruder]...sensor_type: NTC 100K MGB18-104F3950L32sensor_pin: PC1...
```

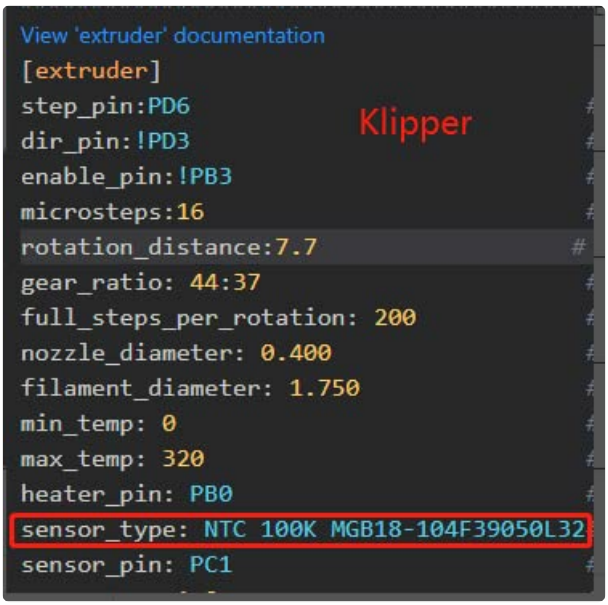

Figure 4.2: Example Klipper firmware snippet showing the `sensor_type` setting for the thermistor.

For **Marlin firmware (V2.X)**, you will typically need to uncomment or define the correct thermistor type in `Configuration.h`. Look for `TEMP_SENSOR_0` and set it to the appropriate value for a 100K B3950 thermistor. This is often optior `61` for "100k Formbot / Vivedino 3950 350C thermistor 4.7k pullup".

```
#define TEMP_SENSOR_0 61
```

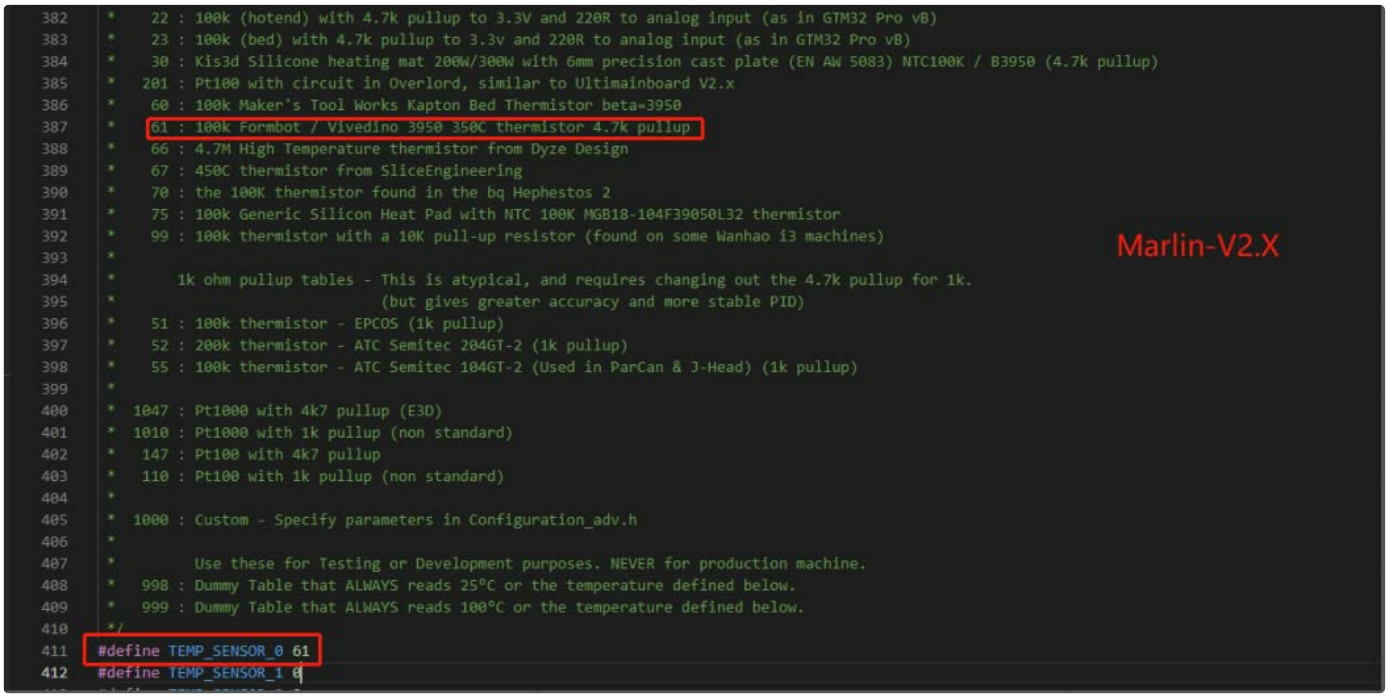

Figure 4.3: Example Marlin firmware snippet showing the `TEMP_SENSOR_0` setting for the thermistor.

After updating firmware, perform a PID (Proportional-Integral-Derivative) tune for the hotend. This calibrates the heating system to maintain a stable temperature and prevents overshooting or undershooting.

5. Operating Instructions

Once installed and configured, operate the hotend as you would any standard 3D printer hotend, keeping in mind its high-temperature capabilities.

- **Maximum Printing Temperature:** While the hotend can reach higher temperatures, for long-term printing, it is recommended to keep the temperature under 300°C to ensure longevity of the thermistor and other components.
- **Filament Compatibility:** This hotend is suitable for a wide range of filaments, including those requiring higher printing temperatures.

- **Nozzle Replacement:** The hotend uses standard V6 Volcano nozzles. Ensure the hotend is heated to printing temperature before attempting to remove or install nozzles to prevent damage.

6. Maintenance

- **Regular Cleaning:** Periodically clean the nozzle and heater block to remove any accumulated filament residue. Ensure the hotend is cooled before cleaning.
- **Silicone Sock:** The silicone sock helps maintain temperature stability. If it becomes damaged or smokes, replace it immediately. Some users have reported issues with the included sock; consider purchasing a higher quality replacement if needed.
- **Heat Tightening:** Ensure all threaded connections, especially between the heatbreak, heater block, and nozzle, are properly heat-tightened to prevent filament leaks. This should be done when the hotend is at printing temperature.
- **Fan Functionality:** Ensure the hotend cooling fan (not included with this product, but part of your printer's setup) is functioning correctly to prevent heat creep and clogs.

7. Troubleshooting

Problem	Possible Cause	Solution
Thermal Runaway / Inaccurate Temperature Readings	Incorrect thermistor configuration in firmware; faulty thermistor; loose thermistor connection.	Verify and update firmware with the correct thermistor type (NTC100K B3950). Perform a PID tune. Check thermistor wiring and connections. If issues persist, the thermistor may be faulty and require replacement.
Filament Leaking from Joints	Improperly tightened nozzle or heatbreak; gap between nozzle and heatbreak.	Perform a heat tightening procedure: heat the hotend to printing temperature and tighten the nozzle and heatbreak connections. Ensure the nozzle is fully seated against the heatbreak inside the heater block.
Hotend Clogging	Heat creep due to insufficient cooling; partial clog; incorrect retraction settings.	Ensure your hotend cooling fan is operating effectively. Try a cold pull to clear partial clogs. Adjust retraction settings in your slicer.
Silicone Sock Smoking/Damaged	Overheating; material degradation.	Immediately power off the printer. Replace the silicone sock. Consider a higher quality replacement.

8. Specifications

Feature	Detail
Model	CHC Pro Hotend (Compatible with V6 Volcano Hot End)
Voltage	24V
Power	115W
Nozzle Diameter	0.4mm (Brass, V6 Volcanic type)
Filament Diameter	1.75mm
Thermistor Type	NTC100K B3950 (Max sensing 320°C)
Recommended Max Printing Temp	300°C (for long-term printing)
Heatbreak Material	Copper alloy and Titanium Alloy TC4
Heating Element	Ceramic heating ring with built-in copper plated heating loop
Package Dimensions	4.41 x 3.23 x 1.26 inches
Weight	3.53 ounces

9. Warranty and Support

9.1 Warranty Information

Specific warranty details for this product are not provided in the available information. Please refer to the seller's or manufacturer's official website for any applicable warranty policies.

9.2 Customer Support

For technical assistance or inquiries, please contact POLISI3D customer support through their official channels or visit their Amazon store page: POLISI3D Store.