What does the heating failed error mean on a 3D printer?

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Abstract. The hotend warmed too slowly after a heat command, so the printer halted. Marlin 2.1.1 and later want 2 °C in 40 s. A damaged or loose heater cable is the usual cause.

Keywords: error-codes, firmware, hotends

Table 1. The number

Firmware	Hotend must rise	Within	What the printer shows
Marlin 2.1.1 and later (checked at 2.1.2.9)	2 °C	40 s	`Heating Failed: E1`, then `PRINTER HALTED` and `Please Reset`
Marlin 2.1.0 and earlier 2.x (checked at 2.1.0.5)	2 °C	20 s	The same three lines
Prusa MK4, MK3.9, MK3.5 and CORE One	more than 2 °C	20 s	`Hotend preheat error`
Klipper v0.13.0	2 °C	20 s	`Heater extruder not heating at expected rate`

1 What does the heating failed error mean on a 3D printer?

The hotend did not warm up fast enough after a heat command, so the firmware switched off every heater and halted the printer for safety. Marlin 2.1.1 and later expects a 2 °C rise within 40 s. Prusa says the most common cause is a damaged or loosely connected heater cable.

1.1 The number

Marlin's values are the `WATCH_TEMP_INCREASE` and `WATCH_TEMP_PERIOD` defaults in Configuration_adv.h at release tags 2.1.2.9, 2.1.1 and 2.1.0.5, and its screen text is from language_en.h. Prusa's values come from its preheat error articles, and Klipper's are the `heating_gain` and `check_gain_time` defaults in verify_heater.py. Printer makers can change Marlin's defaults, so a stock build may differ.

1.2 Why does Marlin halt the printer?

Whenever `M104`, `M109` or `M303` raises the hotend target, Marlin starts a timer. If the temperature has not climbed by `WATCH_TEMP_INCREASE` when `WATCH_TEMP_PERIOD` runs out, the printer halts and only a hard reset clears it. The check skips a hotend already close to its target, so the error appears during heat-up.

Marlin cannot tell a harmless fault from a dangerous one. Its configuration notes warn that a thermistor that falls out "will report the much lower temperature of the air in the room, and the firmware will keep the heater on." A broken heater circuit looks the same to the firmware: power in, no heat back.

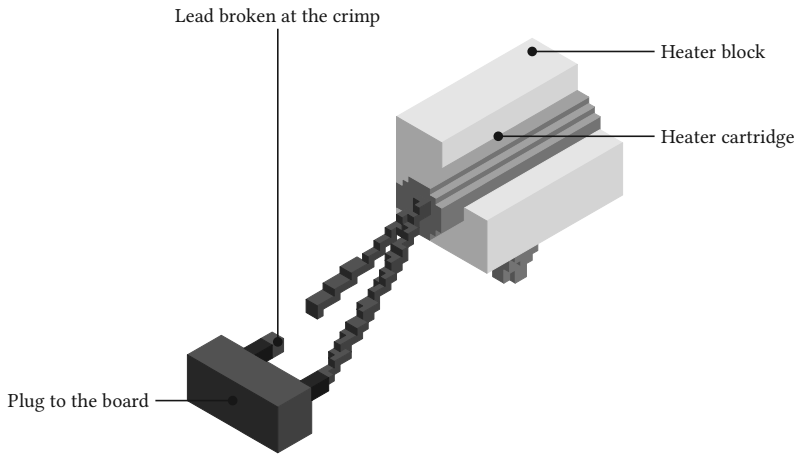


Figure 1. With one heater lead broken at its crimp, no current reaches the heater cartridge, so the block never warms and the heat-up check halts the printer.

1.3 What does E1 mean in “Heating failed E1”?

`E1` names the heater, not an error number. Marlin’s screens count tools from 1, so the first hotend shows as E1, while Marlin’s code and most board silkscreens call it E0. The serial log uses that zero-based name: `Error:Heating failed, system stopped! Heater_ID: E0`. On a Creality Ender-3 or CR-10 running Marlin, `E1` is the nozzle heater, and the same checks apply.

1.4 Why is my 3D printer nozzle not heating?

Watch the hotend temperature during heat-up. If it sits at room temperature and never moves, no current is reaching the heater cartridge: look for a broken lead or crimp, a plug off the board, a blown heater fuse or a dead cartridge.

If it climbs too slowly, heat is escaping or the tuning is off:

- **A missing or torn silicone sock.** Bambu Lab says cold air on an uncovered block causes temperature swings.
- **A cold room.** Prusa wants the room stable above 18 °C for the MK4 and above 10 °C for the MK3.5.
- **Old PID (proportional-integral-derivative) values.** Tuning from before a heater cartridge, heater block or hotend swap may not fit the new parts.

If the reading jumps around or shows an impossible value, suspect the thermistor (MINTEMP error).

1.5 How do I clear the heating failed error?

Fix the cause, then switch the printer off and on: `Please Reset` means Marlin needs a hard reset. After replacing a heater cartridge, heater block or hotend, run a PID autotune. Marlin’s documented example, `M303 E0 C6 S210 U1`, tunes hotend 0 at 210 °C for 6 cycles and applies the result. `M500` saves it if your firmware has EEPROM settings.

Never lengthen `WATCH_TEMP_PERIOD` or turn the check off to get past the error. If the hotend reaches its target and then drops, that is a thermal runaway error. For the bed, see heating failed on the bed.

1.6 How to check it on your own printer

- **Do the hairdryer test.** With the printer on, blow hot air at the hotend and watch the reading. Prusa says a rise means the thermistor works and the heater is at fault; no change puts the blame on the thermistor.
- **Reseat the plugs and test the fuse.** Power off and let it cool. Push the heater plug home on the mainboard or toolhead board and look for a lead pulled from its crimp. Prusa also tests the extruder heater fuse for continuity.
- **Flex the leads while you measure.** Unplug the heater and put the meter across its pins on the 200 Ω range. Prusa warns of micro-fractures that break the circuit only in some positions, so bend the cable along its length and watch for a jump.
- **Read the resistance.** Hotend heaters on Prusa’s MK3S, MK4, XL and CORE One measure 12.3 to 15.1 Ω, inside Prusa’s general 1 to 20 Ω range for heaters. A steady open circuit with sound plugs and crimps means a dead heater cartridge. Without a reference value, check continuity: the meter beeps when the circuit is whole.

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