What is a MINTEMP error, and is it dangerous?

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Abstract. MINTEMP is a safety shutdown: Marlin trips below 5 °C, usually from an unplugged or broken thermistor wire. What to check, including a Prusa MK4 after a nozzle swap.

Keywords: error-codes, hotends, firmware

Table 1. The number

Firmware or printer	Hotend trips below	Bed trips below	What the screen says
Marlin 2.1.2.5, stock `Configuration.h`	5 °C (`HEATER_0_MINTEMP`)	5 °C (`BED_MINTEMP`)	`Err: MINTEMP`
Prusa MK4, MK4S, MK3.9, CORE One	5 °C	5 °C	"Check the print head thermistor wiring for possible damage." (#13208 on the MK4) or "Check the heatbed thermistor wiring for possible damage." (#13207 on the MK4)
Prusa MK3, MK3S, MK3S+	10 °C	10 °C	`MINTEMP` or `MINTEMP BED`
Prusa MK2/S, MK2.5/S	22 °C	15 °C	`MINTEMP` or `MINTEMP BED`
Klipper	Your `min_temp` (set per printer, no default)	Your `min_temp`	`ADC out of range`

1 What is a MINTEMP error, and is it dangerous?

A MINTEMP error means the firmware read a temperature too low to trust (under 5 °C in Marlin's defaults) and cut the heaters. The error is not dangerous: it is the safety net. The usual cause is an unplugged or broken thermistor wire. Bypassing the check is the danger, since a heater with no valid reading can overheat.

1.1 The number

Marlin's limits and screen text are the stock values in its 2.1.2.5 release; a printer maker can change them in its own build. Prusa's come from its Knowledge Base articles on MINTEMP (MK2 and MK3 series) and on the hotend and bed mintemp errors (MK4 family). Klipper's come from its v0.13.0 configuration reference and source.

1.2 Why does a cold reading shut the printer down?

A thermistor is a resistor whose value climbs as it cools. Prusa rates its thermistors at 100 kΩ at 25 °C and expects 80 to 125 kΩ across a 20 to 30 °C room. An unplugged or broken lead is an open circuit, which the board reads as colder than any room (0 °C on a Prusa MK3, by Prusa's account). Marlin's config gives the same reason for its 5 °C floor: a reading that low "probably indicates a broken thermistor wire."

The check matters because the firmware heats until the reading reaches the target. A dead sensor never gets there, so the firmware would keep "pumping more power into the heat bed or hotend heater cartridge," in Prusa's words. Marlin instead switches every heater off and halts until you reset. It runs the check only while a heater has a target temperature, so the error shows up the moment you preheat or start a print.

1.3 What does MINTEMP mean on a Prusa printer?

On the MK3 series, `MINTEMP` is the hotend and `MINTEMP BED` is the bed. If the reading recovers, the screen changes to "MINTEMP fixed" and then "Please restart", which you clear with the X button under the knob. Prusa warns that the fix may not last: a repeat points to an intermittent break in the thermistor wire, which shows as a temperature that jumps during X or Y moves. On the MK4 family, the bed error can fire even while the printer is idle and unheated.

1.4 Can a cold room cause a MINTEMP error?

Yes, though on Marlin's default it takes a room below 5 °C, such as an unheated garage in winter. On a Prusa MK2 series the hotend trips at 22 °C, so an ordinary cool room can do it. Prusa wants the room above 20 °C in its MK3-era article and stable above 18 °C for the MK4 family, away from open windows, air conditioning and drafts. If cold is the only cause, warm the bed or hotend with a hairdryer until it reads above 18 °C, then start the print.

1.5 How do I fix a MINTEMP error after a nozzle change?

Suspect the wiring you just touched: a nozzle swap means handling the heater block, and on a Prusa MK4 it means unplugging the hotend cables too. Prusa calls the spot where the thermistor wire enters the heater block fragile, so check the lead there for a pinch or kink. Then reseat the plug at the board, heat the nozzle and watch the reading climb.

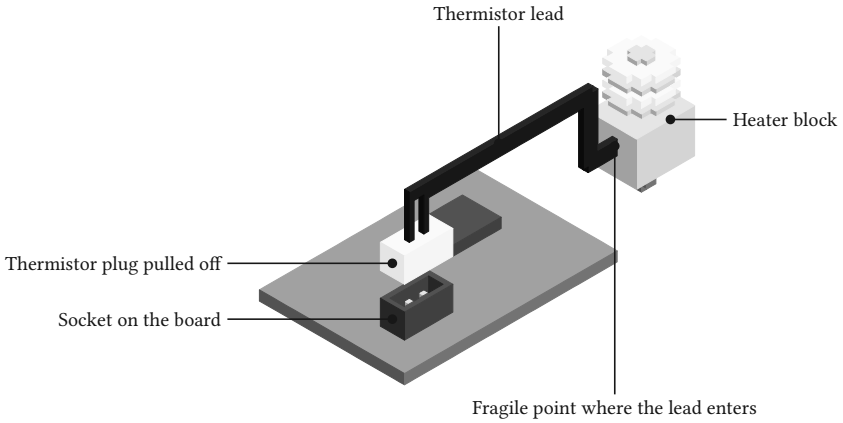


Figure 1. An unplugged or broken thermistor lead is an open circuit, which the board reads as colder than any room, so the firmware refuses to heat.

1.6 Why does my Prusa MK4 show a thermistor error after a nozzle swap?

Prusa's nozzle guide for the MK4 and MK3.9 has you unplug the hotend heater and thermistor at the LoveBoard, the small board on the extruder, and slide the hotend out. If one goes back wrong, you get #13208. Check the points the guide flags:

- **Slots:** the thermistor goes in the top left slot of the LoveBoard, the heater in the black slot on its upper part.
- **Latches:** each connector has a safety latch. Press it before pulling, or the connector may be damaged.
- **Pinches:** no cable caught between the thumb screws and the heatsink, or under the LoveBoard cover. The cover clicks at its rear latch when fully home.
- **Final check:** go to **Control > Temperature > Nozzle Temperature**, set it above 200 °C and watch the reading rise on the bottom bar.

If the wiring is right, Prusa's hotend mintemp article moves on to the extruder fuse on the xBuddy mainboard and the LoveBoard main cable.

1.7 How to check it on your own printer

- **Reseat the plug.** With the printer off and cool, push the thermistor plug fully home on the board until the latch snaps in.
- **Do the wiggle test.** Prusa preheats to PLA (polylactic acid) temperatures, 215 °C nozzle and 60 °C bed, then moves the head and bed by hand to each end and flexes the cable sleeve. A jump of tens of degrees, or a drop to zero, means a broken wire.
- **Measure it.** With the printer off and at room temperature, unplug the thermistor and set the meter to its 200K range. Prusa expects 80 to 125 kΩ, and no reading at all means an open circuit. If it differs from the other thermistor, one of them is probably faulty.
- **Swap plugs to test the board.** On a Prusa MK3, swap the hotend and bed thermistor plugs. If `MINTEMP` does not become `MINTEMP BED`, or the reverse, the board connector is at fault.
- **Replace, never bypass.** A thermistor with visible damage, erratic readings or no reading gets replaced. Prusa warns that adjusting the MINTEMP limits "is NOT RECOMMENDED and might lead to damage to the printer and a possible fire hazard!"

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