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## Calibrating your Nano 7 fan speed :: Kaffeologic

7–9 Minuten

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**TLDR;)** If you are getting burnt beans in among the roasted beans you should increase your fan calibration number. Turn your Nano 7 off, then hold down the - and + buttons while you turn it back on again. You should see "Calibration mode" on the screen. Press ☰ until you see "fan speed" then press ▶. Your fan speed calibration number should appear in the top left of the screen. Press + three times to increase this number. Press ▶ twice and you should see "Saved." Job done. Turn your Nano 7 off and on again, and it should now roast evenly.

### What is transitional fluidisation?

The Kaffeologic Nano 7 is an air roaster that uses *transitional fluidisation*. This means the beans in the roaster are in transition between glass flow and fluid flow.

Glass flow means the beans are in direct contact with one another. They move, but the beans at the bottom of the bean mass do not change places with the beans at the top very quickly – similar to molecules in glass as it begins to soften. When we roast in the glass flow state the roast will be characterised by a number of beans that turn brown, go through first crack, and burn while the rest of the batch are still browning.

Fluid flow means each bean floats on a cushion of hot air. This air keeps the beans separate and causes them to circulate freely. When we roast in the fluid state the roast will be very clean and even. However, it also uses a lot of heat as most of the heat is carried away before it transfers to the beans.

The Kaffeologic Nano 7 roasts at the transitional point between glass flow and fluid flow. The bean mass can be seen to rise and fall as it transitions between the two states. However, the air speed needs to be accurately set otherwise the roast can slip down into glass flow and the result will be some burnt beans in every batch.

There are two ways to remedy the fault of uneven/burnt roasts. One

is to decrease the batch size to allow the beans to fluidise better, and the other is to increase fan speed.

## When do I need to re-calibrate?

If you have been using a batch size of 120g and you are experiencing uneven/burnt roasts with just one particular bean type you might want to try reducing the batch size to 100g for that bean type.

On the other hand, if you are experiencing uneven/burnt roasts with most of your roasts, your roaster might need re-calibration of air speed.

We shipped some uncalibrated series A roasters (stainless steel version) to crowd-funding supporters, but all series B roasters (black version) have been factory calibrated. However, whether due to adjustment being affected by shipping or by normal use, you will want to re-calibrate if your roaster starts delivering uneven/burnt roasts.

## How to use calibration mode

- The roaster goes into calibration mode if you **turn it on with both – and + buttons held down**. Do this with an empty roast chamber.
- **In calibration mode, change options with the ☰ button**, and select an option with the ► button. For the purpose of fan speed re-calibration you can skip over supply voltage and cool down calibration.
- **Record the calibration value you start with so that you can restore it if need be.**
- **Adjust calibration values with – and + buttons**. Confirm and **save the new value ►►**, or exit without saving ► ☰.
- Ensure that you save the value before turning the machine off otherwise the value will not be retained.
- The only way to exit calibration mode is to turn the machine off.

## Fan calibration method

If you are experiencing uneven/burnt roasts, turn the fan speed calibration up by two or three clicks of the + button (i.e. increase the number by 0.02 or 0.03). If, for example, your roaster has a fan speed calibration number of 0.89 increase it to 0.91 or 0.92. After saving the new calibration number, carry out another test roast. If beans are still uneven/burnt increase the calibration number even further. If two increases like this don't solve the problem then there

is potentially something else wrong: contact Kaffeologic customer support.

If your roaster cannot follow a profile, but instead temperatures fall consistently under the profile curve, you may need to turn the fan speed calibration down. In this case we recommend a full test roast, as described below.

Factory calibration is done with a particular anemometer setup, but this is not currently available to customers.

### **Full test roast procedure**

1. Load the roast chamber with 123g Brazil Cerado green beans.
2. Load the Ninja profile and set the level to 2.9.
3. Ensure you have a memory stick in the USB port to collect a roast log.
4. Start the roast.
5. Immediately lift the lid to examine the bean circulation. You should see turnover in the middle of the bean mass, with periodic bounces of the central bean mass every few seconds. If there is no central turnover or bounce then you are probably looking at a low speed fail.
6. At about 140 deg C again lift the lid. Bean circulation should now be more vigorous with marked central turnover and bounce. Beans should be beginning to turn from green to yellow. If there are some brown beans among the yellow this is called speckling and is a sure sign of low speed fail.
7. Listen for first crack. This should commence at 207 deg C. You might hear two or three quiet crackles preceding first crack, but these should be ignored if they are significantly quieter than full cracks. If you hear full cracks earlier than 203 deg C then this is known as early popping and is another symptom of low speed fail. These are the beans that were already brown at 140 deg C now cracking early.
8. During the first part of cool down check the lid for dancing. The lid should shudder, but not lift off and dance. A dancing lid is a possible indicator of a high speed fail.
9. At the completion of cooldown weigh the chaff. Subtract 1g for the true chaff, and the balance is the weight of beans-in-chaff. BiC should not exceed 4.5g. These weights only apply to the specified bean type. Excess BiC is a possible indicator of a high speed fail.
10. At roast completion examine the log for the following:

1. Maximum power (the black line) in the range 1120 to 1330. The low part of this range applies with good power supply where voltage does not drop once you start the roast, and the high part applies with bad power supply (e.g. some distance from the mains box) where the voltage drops 4 or 5 V once you start the roast. The roaster does not use any more power with bad power supply, but it calculates the amount of power slightly incorrectly under this condition. Using more than 1330W peak is a possible indicator of a high speed fail., while less than 1120 is a possible indicator of a low speed fail.
2. The power log line (the black line) should not have a flat top, which is a sign of high speed fail or a sign of really bad power supply. Do not test roast with a really bad power supply because you need to be able to detect high speed failure.
3. Maximum negative RoR during cool down in the range -420 to -480 deg/min. Faster cooling is a possible indicator of a high speed fail.
4. Look for any major departures from the profile – if any seen there might be some other issue that needs addressing.
11. Finally check the beans visually. There will be a few examples of dark shades, but there should not be any fully burnt beans. If there are burnt beans scattered through the coffee this is speckling and represents a low speed fail.

If you have a low speed fail, increase the fan speed calibration setting by 0.02 or 0.03. If you have a high speed fail reduce it by the same amount. Fan speed calibration settings below 0.89 and above 1.02 are unusual. Do not go outside the range 0.87 to 1.05. If you need to go outside this range there is almost certainly some other fault – contact Kaffellogic support.