

Topten-Research on the Auto-power-down delay times of Coffee machines

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1. *Introduction and objectives*

- The keeping hot of the water to produce a cup of coffee immediately whenever required is the function that uses the biggest share of energy of coffee machines. A simple, but effective measure to reduce this energy consumption is an auto-power-down function.
- Many of the coffee machines currently available on the Swiss and the European Market meanwhile offer such an auto-power-down function.
- Usually, these coffee machines are equipped with a default delay time until auto-power-down. However, additional delay times often can be programmed by the user. The longer the delay time until auto-power-down, the more energy uses the appliance, which worsens its energy efficiency.
- Topten studied the default (factory setting) and programmable values of the auto-power-down delay times of the most efficient coffee machines currently offered on the Swiss and the European market.

2. *Methods*

- Analysis of the most energy efficient coffee machines (capsule machines and fully automatic machines) according the lists presented on www.topten.eu (Europe) und topten.ch (Switzerland).
- Internet research: values according online available instruction manuals (per Friday, 6th January 2012 and Monday, 9th January 2012).
- Requests by phone and in written form with producers and retailers, which do not offer their instruction manuals online (Krups / Rowenta, Coop).
- In few cases the measuring protocol have been comprised to find out the programmable delay times. (Measuring Method and Calculation Formula for the Electricity Consumption of Coffee Machines for Household Use. Euro-Topten and S.A.F.E., 9th May 2009.)

3. Results

A total of 109 coffee machines has been evaluated, thereof 43 capsule machines and 66 fully automatic machines.

- The group of capsule machines consists of 24 main models and 19 similar models.
- The group of fully automatic machines consists of 33 main models and 33 similar models.

Results capsule machines (43 models)

Default auto-power-down delay time (factory setting)	Number of models
Immediately (0 Min., 0.3 Min., 1 Min.)	12 (7 main models, 5 similar models)
5 Min	18 (6 main models, 12 similar models)
7 – 15 Min	11 (9 main models, 2 similar models)
30 Min	2 main models

Programmable auto-power-down delay time	Number of models
Not programmable (only default value)	36 (19 main models, 17 similar models) (those appliances with default delay time of 0 Min, 0.3 Min, 7 Min, 9 Min, 15 Min)
Up to 0.5 h	1 main model
Up to 1 h	1 main model
Up to 4 h	1 main model
Up to 8 h	1 main model
No data found	3 (1 main model, 2 similar models)
Auto-power-down can be deactivated	22 (8 main models, 14 similar models)
No information, whether auto-power-down can be deactivated or not.	3 (1 main model, 2 similar models)

Results fully automatic machines (66 models)

Default auto-power-down delay time (factory setting)	Number of models
0.5 h	13 (5 main models, 8 similar models)
1 h	37 (19 main models, 18 similar models)
1.25 h	1 main model
2 h	15 (8 main models, 7 similar models)

Programmable auto-power-down delay time	Number of models
Not programmable (only default value)	5 (3 main models, 2 similar models)
Up to 2 h	4 (2 main models, 2 similar models)
Up to 3 h	12 (7 main models, 5 similar models)
Up to 4 h	11 (3 main models, 8 similar models)
Up to 5 h	6 (5 main models, 1 similar model)
Up to 8 h	8 (3 main models, 5 similar models)
Up to 9 h	9 (6 main models, 3 similar models)
Up to 12 h	9 (2 main models, 7 similar models)
Up to 15 h	2 main models
Auto-power-down can be deactivated	1 main model
No information, whether auto-power-down can be deactivated or not.	2 (1 main model, 1 similar model)

4. Discussion

- The investigated capsule machines in general have shorter delay times until they go to auto-power-down (factory setting) than the investigated fully automatic machines. The longest delay time (default) found within the Topten-Capsule machines is 30 minutes, within the Topten-fully automatic machines it is 2 hours.
- About one quarter of the investigated capsule machines (12 of 43 models) switch-off immediately after coffee preparation, that is after 0 minutes, 0.3 minutes or 1 minute. In particular these are machines which are equipped with a flow-type heater, e.g. the Tassimo models of Bosch. Additionally one appliance with boiler switches off immediately after coffee is prepared (DUO from Tchibo). Most of the investigated capsule machines (18 models) switch off automatically 5 minutes after last coffee preparation (default). 11 models switch off after 7 to 30 minutes (whereat only 2 models switch off after 30 minutes). Conclusion: practically all of the investigated models (41 of 43) switch off automatically (default) at latest after 15 minutes after last coffee preparation.
- 36 of the 43 investigated capsule machines offer a fix default delay time until auto-power-down, which cannot be changed by the user. For 4 models the delay time can be reprogrammed by the user. One of the appliances can be reprogrammed up to 8 hours! For 3 models there were no data available on the programmable delay times.
- For more than the half of the investigated capsule machines (22 of 43) the auto-power-down function can be fully deactivated! The consequence is that the appliance permanently is in the on mode/ready mode. To offer the user this option is dubiously and hardly compatible with an efficient appliance. (Note September 2012: these information base on producers information. A few month after this research was finished the respective producers commented on that topic again. They noted that there was probably a misunderstanding and that only the producers could deactivate the auto-power-down function for test purpose, but not the consumers).
- Most of the investigated fully automatic machines (50 of 66 models) have a default delay time until auto-power-down of 0.5 h or 1 h. 1 model has a default delay time of 1.25 hours. The other models (15) automatically switch-off after 2 hours.
- For 5 fully automatic machines the delay time is fix, and cannot be changed by the user. Most models (57 of 66) can be programmed up to 3 hours and even longer such as 4, 5, 8, 9, 12 hours (9 models) and even up to auf 15 hours (2 models)!
- For one of the investigated fully automatic machines the auto-power-down function can be deactivated. As mentioned above, this option is questionable and hardly compatible with an appliance declared being efficient.
- Bad and good examples were found in the instruction manuals, how the user is animated to prolong the delay time (which results in a higher energy consumption) or how the user is encouraged to shorten the delay time and to save energy.
 - Bad example: in one of the investigated instruction manuals the user is quasi animated to prolong the delay time. (Jura ENA 5: p. 18, German version: describes how to prolong the delay time from 1 to 2 hours).
 - Good example: in one of the investigated instruction manuals the user gets the information that a reduction of the delay time leads to energy savings. (Siemens EQ 5 / TE 506501DE: p. 8, German version: The default time is 1 hour. It can be shortened to save energy).

5. Recommendations on Auto-power-down delay times

By December 2012

- So far, only the factory settings but not the programmable delay times are outlined in the Amendments Commission Regulation (EC) 1275/2008 (Draft), page 8.
- Topten recommends to close this gap, and therefore recommends, that the auto-power-down delay times outlined in the Amendments Commission Regulation (EC) 1275/2008 (Draft) are identical for factory setting and programmable and that both are understood as a maximum value.