

EHPA Position on Compensation Method

EHPA would like to thank the Commission and the study teams for the work already carried out on the review of the Ecodesign Regulation 813/2013. Following the results shared by BAM during the technical meeting on the compensation method organised by BAM on 30th of March 2022, EHPA would like to present its positions and recommendations on the compensation method. While we welcome BAM's investigation on the compensation method, EHPA strongly disagrees with the assumption that the compensation method will be ready for implementation in this Regulation. Further work, including resolution of the identified issues in the 2020 RRT, additional testing on other heat pump technologies, higher capacity range and standardization activities are needed before the method can be considered ready for public usage. Additionally, a deeper assessment of the relevance of a potential use of the compensation method for regulatory purposes in terms of generated additional test burden (complexity, test time), additional investment for updating testing stands compared to what it delivers in terms of independence from manufacturer and reflectiveness of real-life performance compared to other existing and under development test methods must be conducted once the scoping and technical aspects are resolved:

- Based on the technical data that has currently been shared by BAM, it seems that the results are showing high deviations between the labs and that the source of the encountered issues during testing cannot always be identified with certainty. Due to the diversification of data and lack of details (no data on inlet/outlet temperature, flow rate, etc.), the data does not show enough coherence to create a level of confidence, resulting in a difficulty to understand and assess properly the readiness of implementation of the compensation method.
- The scoping of the tested units must be considered more properly as there are main differences between units of different capacities. The current test results are limited in that sense that they do not reflect the impact on different capacities (up to 400kW) and technologies (variable flow is not included). The method should not only consider inverter driven small capacity HP but all design types of capacity, waterflow and outlet temperature control. For a fair approach, the method shall be applicable to all technologies under the scope of lot 1, regardless of the capacity control, heat source/sink and capacity range and shall not induce a drastic increase of test duration, complexity and required resources and thus costs. From this perspective, it seems relevant to add more tests to understand this better. Currently, there is no proper comparability of appliances possible.
- Based on the RRT results, testing a unit according to the compensation method still requires technical intervention and assistance from manufacturers. Requiring an intervention by manufacturers in order to understand the unit, its construction and settings

to perform the test contradicts the original aim of introduction of the compensation method.

- The results also indicate potential introduction of requirement for the tests stands size and controls which feasibility, acceptance and necessary time for implementation are still unknown. Such uncertainties will affect the conformity assessment process and market surveillance.
- Finally, the new test methods should be introduced by the responsible standardisation committee CEN TC113 and follow the same rigorous review, assessment and validation process conducted for any work item to ensure its robustness and the matureness of reproducibility and repeatability. As EHPA, we are fully supporting the introduction of a new working item to develop a test procedure for the compensation method, even before the mandate is there. With our members we proactively work to accelerate this introduction.

For all these reasons, EHPA strongly disagrees with the assumption that the compensation method will be ready to be employed for implementation in this Regulation, and not even with the optional approach proposed in the draft regulations.

Below you can find more elaboration on these points combined with the technical findings of our members who participated in BAM RRT to explain our position and recommendation. We believe these findings should be considered deeply before any next steps on the compensation method are taken.

EHPA members' experience on the RRTs of BAM

Some EHPA members¹ participated to the round robin tests of BAM to assess the feasibility of introducing the compensation method in the Ecodesign Regulation for air-to-water heat pumps and water-to-water heat pumps². EHPA collected technical comments based on its members' experience with testing according to the compensation method as described in BAM guidelines. Several concerns were highlighted to support our previously mentioned statements:

- The compensation method requires a much longer testing time than the current method, which impacts the development and time to market of products as well as available manpower at the manufacturer's side.
 - o Several On/Off cycles under C conditions of 5 to 6 hours data acquisition period were observed instead of 70 minutes according to EN14511-3. The requirements of the BAM method called for data to be recorded over 4 consecutive cycles. The duration of the On /Off cycles can be conditioned by the design characteristics of the laboratory test facilities, in particular the inertia of the water loop.

¹ As indicated on the list of participants for air-to-water heat pumps and water-to-water heat pumps dating from July 2020

² A RRT on an air-to-air conditioner was also conducted in view of introducing the compensation method in the revision of regulation 206/2012

- On the water-to-water heat pump, the duration of a test point of 8 hours was observed against 2 hours by the standard method. This includes the time for stabilisation of the conditions.
 - It has been observed that some discontinuous tests could last up to 20 hours. The laboratory must therefore be able to manage tests continuously 24 hours a day if a test lasts more than 8 hours. A risk of inadvertent failure of power supply or any other problem, even minor, can lead to extremely long test times. Solutions like automation of testing can only resolve to a limited extend the testing time issue. Automation will require overnight testing, however a 24h/day test is not always possible, and its application differ from country to country or from facility to facility (applies only to those facilities that invested in such an approach and are allowed to test 24h/day, depending on local labour laws). Introducing the automation of testing will impact the resources and procedures already in place and require the necessity of test operators to remain available to control the potential process and errors occurring overnight.
- It has been observed that the tank sizing might results in extremely large volumes of water and therefore creates issues with performing the test for high-capacity units in scope of Lot 1 (up to 400kW), this will require additional investments for testing facilities. Furthermore, big tank sizes will increase the test time as it will take longer to stabilize. This point shall be carefully considered.
 - For each test condition, it is essential to adjust the heat curve of the heat pump in order to adjust the set point water temperature of the heat pump to the temperature measured by the laboratory. The adjustment of this water temperature is very often done by steps of 1K which makes the adjustment within the admissible deviations sometimes limited. Some EHPA members reported that the test conditions were impossible to achieve for the discontinuous test (On /Off cycling).
 - Compliance with operating conditions, or even deviations, has also proved difficult to achieve. On the water-to-water heat pump, the water flow on the cold source side was controlled by the unit, making it difficult to maintain the ΔT of 3K ($T_{inlet} = 10 \text{ }^\circ\text{C}$ / $T_{outlet} = 7 \text{ }^\circ\text{C}$). As for an air-to-water heat pump, it could be considered to adjust only the water inlet temperature on the cold source side for a variable water flow heat pump.
 - For the low temperature application under condition D, the outlet water temperature is 24°C. Using current methodology, when the heat pump is cycling, the outlet water temperature is recalculated. In one of the test, using the BAM method, the outlet and inlet temperatures were 23.6°C and 22.4°C whereas using the current method, the outlet and inlet temperatures were 27.3°C and 22°C. When tested according to the BAM method, the delta T gets very small, as a consequence, the uncertainty of measurement gets higher.

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- An additional drawback to take into consideration, is that for some laboratories it might be difficult to adapt to the new testing method. The constraints are specifically linked to the capacity ranges to be tested under the compensation method.
 - It currently seems difficult to conduct the tests without the manufacturer's or installer's support. A significant level of technical knowledge is required to be able to start and run the unit. Out of the box settings are not fit for this method and, necessary adaptations to the settings during the test are required: set the circulating pump in automatic mode, select the correct heat curve, deactivate the action of the indoor temperature sensor on the water temperature.

We ask that above concerns are carefully considered in the next steps on the compensation method. EHPA strongly disagrees with the assumption that the compensation method will be ready to be employed for implementation in this Regulation, and not even with the optional approach proposed in the draft regulations. No decisions should be taken as to the feasibility of introducing the compensation method ahead of reaching its possible maturity. A level playing field must be ensured in order to give enough time to our sector to transit. We believe that further work is still needed to address the issues identified in the first RRT (inertia, on-off operation,..) and extended the RRT to the entire scope of lot 1. For these reasons, we ask the commission to allow the necessary time that above concerns and additional investigation are carefully considered within the appropriate standardisation committees and we reiterate our believe that the compensation method cannot be introduced before a positive conclusion of this assessment.

Enforced requirements coming from different Regulations are putting pressure on manufacturers to meet these requirements on time while on the other hand to meet EU's strategy to accelerate the transition and deployment of heat pumps. In this context, we also wonder if the compensation method will also be investigated for other Lot 1 products to ensure a "testing" level playing field among different technologies and different energy-source-based equipment.