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Thermal Energy Meters Annex VI (MI-004)

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Participants in the Drafting Group „Cooling“

- Miroslava Benkova, CMI, Czech Republic
- Vim Volmer, Ministry of Economic Affairs and Climate, Netherlands
- Sebastian Baack - PTB, Germany

Representatives of consumers:

- Boris Goy, Techem , Germany

Participants in the Drafting Group „Cooling“

Representatives of manufacturers:

- Maika Haddad, AQUA - Association of Water and Thermal energy meter manufacturers
- Jürgen Westphal - Sensus, Germany
- Ulrich Eff - Diehl Metering, Germany
- Philip Holoch – Belimo, Switzerland
- Christian Bombis – Kamstrup, Denmark
- Marcin Bartnik - APATOR Powogaz S.A., Poland

Cooling meters in the MID

Meters for Thermal Energy (see MID 2014/32/EU MI-004) (Heat-Meters, Cooling-Meters, Bi-Functional Meters for Heating and Cooling)

All meter variants are meters for thermal energy. The difference is only the field of application;

- ✓ Thermal energy exchange circuit for heating applications
- ✓ Thermal energy exchange circuit for cooling applications
- ✓ Thermal energy exchange circuit for heating in winter times and cooling in summer times.

Cooling meters in the MID

In the majority of EU countries Thermal Energy Meters with Cooling function need an additional national conformity declaration.

Bi-functional meters (Heating function in winter-times and Cooling function in summer combined in the same meter used for combined heating and air conditioning systems) need in parallel two conformity declarations. One according to MID for the heating measurement and another for the cooling measurement according to national legislations.

Unfortunately, it is not also uniformly understood.

Cooling meters in the MID

Targeted amendment of MID, MI 004 will ensure the integration of Thermal Energy Meters for cooling applications under the scope of the MID in all member states to avoid any misunderstandings.

The all technical community consisted of notify bodies, manufacturers, market surveillance, etc. is the same opinion, that the thermal energy meters for both applications (heating and cooling) are identical.
Only the parameter configuration handles the different sign of the measuring result.
The measuring result is indicated in kWh in both applications.

Targeted amendment of MID MI 004

MID - Current Reading	Suggestion from WELMEC WG 13 “Water meters and thermal energy meters”and the drafting group MI-004 Thermal energy meters (cooling)	Rationale / Notes
Definition		
A thermal energy meter is an instrument designed to measure the thermal energy which, in a thermal energy exchange circuit, is given up by a liquid called the thermal energy-conveying liquid.	A thermal energy meter is an instrument intended for measuring the energy which, in a heat-exchange circuit is absorbed (cooling) and/or given up (heating) by a liquid called the thermal energy-conveying liquid.	A thermal energy meter is either a complete instrument or a combined instrument consisting of the sub-assemblies, flow sensor, temperature sensor pair, and calculator, as defined in Article 4(2), or a combination thereof <u>Solution:</u> Include the term „or absorbed“ and the term „for heating and $\Delta\theta < 0$ for cooling“ in the definitions part. Taken and slightly modified from EN 1434-1

Targeted amendment of MID MI 004

MID - Current Reading	Suggestion from WELMEC WG 13 “Water meters and thermal energy meters”and the drafting group MI-004 Thermal energy meters (cooling)	Rationale / Notes
Definition		
Δθ = the temperature difference θin — θout with Δθ ≥ 0	Δθ = the temperature difference θin — θout with Δθ > 0 for heating and Δθ < 0 for cooling	Self-explanatory

Targeted amendment of MID MI 004

MID - Current Reading	Suggestion from WELMEC WG 13 "Water meters and thermal energy meters"and the drafting group MI-004 Thermal energy meters (cooling)	Rationale / Notes
Definition		
1.1. For the temperature of the liquid: θ max , θ min , — for the temperature differences: Δθ max , Δθ min , subject to the following restrictions: Δθ max /Δθ min ≥ 10; Δθ min = 3 K or 5 K or 10 K.	1.1. For the temperature of the liquid: θ max , θ min , — for the temperature differences: Δθ max , Δθ min , subject to the following restrictions: Δθ max /Δθ min ≥ 10 with the exception of cooling applications; Δθ min is a integer number in the range of 1 K and 10 K	1.There might be conditions where other temperature difference values are technically needed, for example in asymmetric built-in situations of temperature sensor pairs. 2. Temperature differences in cooling systems might be lower than 3 K. Manufacturers of temperature sensors develop new sensors and should not be inhibited in their work of pushing the state of the art. Nevertheless, there are currently high requirements that have to be fulfilled when measuring at lower temperature differences than 3 K. Therefor, one could add a respective recommendation. "(Due to high requirements when measuring at low temperature diferences, Δθ min ≥ 3 K is recommended)"

Targeted amendment of MID MI 004

MID - Current Reading	Suggestion from WELMEC WG 13 "Water meters and thermal energy meters"and the drafting group MI-004 Thermal energy meters (cooling)	Rationale / Notes
Definition		
1.3. For the flow rates of the liquid: q_s , q_p , q_i , where the values of q_p and q_i are subject to the following restriction: $q_p / q_i \geq 10$.	1.3. For the flow rates of the liquid: q_s , q_p , q_i , where the values of q_p and q_i are subject to the following restriction: $q_p / q_i \geq 5$	1. The differences between EN 1434 and MID have been noticed. 2. There might be conditions where other flow rate ratios are technically needed, for example in asymmetric built-in situations of temperature sensor pairs. 3. Considering the wider range of viscosity of usual coolants in comparison to water the permission of ratio of $q_p / q_i \geq 5$ shall be granted.

Cooling meters in the MID

Generaly - Cooling Meters are not included in MID MI-004 caused by false formulations and definitions.

Thus, cooling meters are regulated nationally leading to additional expenses for national conformity assessments and trade barriers for manufacturers and users.

The standard CEN EN 1434 used by notify bodies, manufacturers and other concerned authorities includes cooling meters so that heat and cooling meters and their combinations can be derived for MI-004.

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THANK YOU FOR YOUR ATTENTION!

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