



SLOVENSKI STANDARD
SIST EN 1434-5:1997/A1:2002

01-november-2002

Toplotni števci - 5. del: Overjanje

Heat meters - Part 5: Initial verification tests

Wärmezähler - Teil 5: Ersteichung

Compteurs d'énergie thermique - Partie 5: Essais de vérification primitive

Ta slovenski standard je istoveten z: EN 1434-5:1997/A1:2002

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ICS:

17.200.10 Toplota. Kalorimetrija Heat. Calorimetry

SIST EN 1434-5:1997/A1:2002 **en**

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ICS 17.200.10

English version

Heat meters - Part 5: Initial verification tests

Compteurs d'énergie thermique - Partie 5: Essais de
vérification primitive

Wärmezähler - Teil 5: Ersteinrichtung

This amendment A1 modifies the European Standard EN 1434-5:1997; it was approved by CEN on 1 July 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 1434-5:1997/A1:2002) has been prepared by Technical Committee CEN/TC 176 "Heat meters", the secretariat of which is held by DS.

This Amendment to the European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this Amendment to the European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

This amendment to EN 1434-5 is divided into 2 main areas. The first being the new clauses – i.e. clauses which are not present in the 1997 version. The second being the amended clauses, where the entire clause – not only the changes – is presented.

It has been prepared in such a way that it can be cut and pasted into the old version.

A new descriptor has been added: cooling meters.

1 Amended clauses

NEW TEXT

1 Scope

This European Standard applies to heat meters, that is to instruments intended for measuring the heat which, in a heat-exchange circuit, is absorbed or given up by a liquid called the heat-conveying liquid. The heat meter indicates the quantity of heat in legal units.

Electrical safety requirements are not covered by this standard.

Pressure safety requirements are not covered by this standard.

Surface mounted sensors are not covered by this standard.

Part 1 specifies general requirements.

NEW TEXT

5.1 Flow sensors

The verification of the flow sensor shall be carried out within each of the following flow-rate ranges at a water temperature of $(50 \pm 5) \text{ }^\circ\text{C}$ for heating applications and $(15 \pm 5) \text{ }^\circ\text{C}$ for cooling applications

- a) $q_i \leq q \leq 1,1 q_i$
- b) $0,1 q_p \leq q \leq 0,11 q_p$
- c) $0,9 q_p \leq q \leq 1,0 q_p$

If the pattern approval certificate so provides, the verification may be carried out with cold water in accordance with the procedures laid down in the certificate.

When testing the flow sensors, the guidelines in the pattern approval certificate shall be followed (e.g. requirements for water conductivity, water temperature, straight inlet/outlet tubes etc.).

NEW TEXT

5.2.1 Error in temperature difference

The individual temperature sensors of the temperature sensor pair shall be tested, without their pockets, in the same temperature bath at temperatures within each of the three temperature ranges in Table 1.

Table 1 - Test temperature ranges

No.	For θ_{\min}	Test temperature range	
		Heating	Cooling
1	< 20 °C	θ_{\min} to $\theta_{\min} + 10$ K	0 to 10 °C
	≥ 20 °C	35 to 45 °C	
2	All θ_{\min}	75 to 85 °C	35 to 45 °C
3	All θ_{\min}	$\theta_{\max} - 30$ K to θ_{\max}	75 to 85 °C

NOTE If specified in the pattern approval certificate, variations in the temperature ranges and the number of temperatures are permissible

The immersion depth of the temperature sensors shall not be less than the minimum immersion depth.

The determined resistance values shall be used in a system of three equations to calculate the three constants of the temperature/resistance equation of EN 60751 and a curve shall be drawn through the three test points. Thereby the characteristic curve for the temperature sensor is known.

The "ideal" curve using the standard constants of EN 60751, shall be generated. To give the error at any temperature, the "ideal" curve shall be subtracted from the characteristic curve for each temperature sensor.

As a further step, the worst case error of the temperature sensor pair shall be determined over the temperature range and over the temperature difference range specified for the sensors.

For return temperatures above 80 °C, only temperature differences over 10K shall be taken into account.

The error determined as described above shall be within the limits stated in 9.2.2.2 of EN 1434-1:1997.

When measuring resistance, the current shall be such, that the power dissipation does not exceed 0,2 mW RMS.

NEW TEXT

5.3 Calculator

The calculator shall be tested, at least within each of the following temperature difference ranges:

For heating applications:

- a) $\Delta\theta_{\min}$ $\leq \Delta\theta \leq 1,2 \Delta\theta_{\min}$
- b) 10 K $\leq \Delta\theta \leq 20$ K
- c) $\Delta\theta_{\max} - 5$ K $\leq \Delta\theta \leq \Delta\theta_{\max}$

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For cooling applications:

- a) $\Delta\theta_{\min} \leq \Delta\theta \leq 1,2 \Delta\theta_{\min}$
- b) $0,8 \Delta\theta_{\max} \leq \Delta\theta \leq \Delta\theta_{\max}$ but $< 15 \text{ K}$

The simulated flow rate signal shall not exceed the maximum acceptable by the calculator.

The return temperature shall be in the temperature range between 40 °C and 70 °C for heating applications and (20 ± 5) °C for cooling applications, if not otherwise stated in the pattern approval certificate.

To enable rapid testing of the calculator, it is customary to by-pass the indicating device of the heat meter. However, for at least one test, the meter's indicating device shall be included.

NEW TEXT

5.6 Complete meter

The verification of the complete meter shall be carried out, at least within each of the following ranges

For heating applications:

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- a) $\Delta\theta_{\min} \leq \Delta\theta \leq 1,2 \Delta\theta_{\min}$ and $0,9 q_p \leq q \leq q_p$
- b) $10 \text{ K} \leq \Delta\theta \leq 20 \text{ K}$ and $0,1 q_p \leq q \leq 0,11 q_p$
- c) $\Delta\theta_{\max} - 5 \text{ K} \leq \Delta\theta \leq \Delta\theta_{\max}$ and $q_i \leq q \leq 1,1 q_i$

For cooling applications:

- a) $\Delta\theta_{\min} \leq \Delta\theta \leq 1,2 \Delta\theta_{\min}$ and $0,9 q_p \leq q \leq q_p$
- b) $\Delta\theta_{\max} - 5 \text{ K} \leq \Delta\theta \leq \Delta\theta_{\max}$ and $q_i \leq q \leq 1,1 q_i$

The return temperature shall be in the temperature range between 40 °C and 70 °C for heating applications and (20 ± 5) °C for cooling applications, if not otherwise stated in the pattern approval certificate.