



**NSAI**  
Standards

Irish Standard  
I.S. EN 1434-1:2015

## Heat meters - Part 1: General requirements

**I.S. EN 1434-1:2015**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

EN 1434-1:2015

*Published:*

2015-11-04

*This document was published under the authority of the NSAI and comes into effect on:*

2015-11-22

ICS number:

17.200.10

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

## National Foreword

I.S. EN 1434-1:2015 is the adopted Irish version of the European Document EN 1434-1:2015, Heat meters - Part 1: General requirements

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with this document does not of itself confer immunity from legal obligations.**

*In line with international standards practice the decimal point is shown as a comma (,) throughout this document.*

This page is intentionally left blank

EUROPEAN STANDARD

EN 1434-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2015

ICS 17.200.10

Supersedes EN 1434-1:2007

English Version

## Heat meters - Part 1: General requirements

Compteurs d'énergie thermique - Partie 1:  
Prescriptions générales

Wärmezähler - Teil 1: Allgemeine Anforderungen

This European Standard was approved by CEN on 5 September 2015.

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

This European Standard 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	4
<b>1 Scope</b> .....	<b>6</b>
<b>2 Normative references</b> .....	<b>6</b>
<b>3 Terms and definitions</b> .....	<b>6</b>
<b>4 Types of instruments</b> .....	<b>11</b>
4.1 General.....	11
4.2 Complete instrument.....	11
4.3 Combined instrument.....	11
4.4 Hybrid instrument.....	11
4.5 Sub-assemblies of a heat meter, which is a combined instrument.....	11
4.5.1 General.....	11
4.5.2 Flow sensor.....	12
4.5.3 Temperature sensor pair.....	12
4.5.4 Calculator.....	12
4.6 Equipment under test (EUT).....	12
<b>5 Rated operating conditions</b> .....	<b>12</b>
5.1 Limits of temperature range.....	12
5.2 Limits of temperature differences.....	12
5.3 Limits of flow rate.....	12
5.4 Limit of thermal power.....	13
5.5 Limits of working pressure ( $P_S$ and $P_{min}$ ).....	13
5.6 Nominal pressure (PN).....	13
5.7 Limits in ambient temperature.....	13
5.8 Limits in deviations in supply voltage.....	13
5.9 Maximum pressure loss.....	13
5.10 Specific requirements on registration devices.....	13
5.10.1 General.....	13
5.10.2 Suitability.....	13
5.10.3 Rated operated conditions.....	14
5.10.4 Indication.....	14
5.10.5 MPE.....	15
<b>6 Technical characteristics</b> .....	<b>15</b>
6.1 Materials and construction.....	15
6.2 Requirements outside the limiting values of the flow rate.....	16
6.3 Display.....	16
6.4 Protection against fraud.....	16
6.5 Supply voltage.....	17
6.6 Qualifying immersion depth of a temperature sensor.....	17
6.7 The influence on a temperature sensor pair caused by mounting in pockets.....	17
6.8 Reproducibility.....	17
6.9 Repeatability.....	17
6.10 Software.....	18
<b>7 Specified working range</b> .....	<b>18</b>
7.1 General.....	18

7.2	Temperature difference .....	18
7.3	Flow rate .....	18
8	Heat transmission formula .....	18
9	Metrological characteristics (Maximum Permissible Error, MPE) .....	19
9.1	General .....	19
9.2	Values of maximum permissible errors .....	19
9.2.1	Maximum permissible relative errors of complete heat meters.....	19
9.2.2	Maximum permissible relative error of sub-assemblies .....	19
9.3	Application of maximum permissible errors .....	20
10	Environmental classification.....	20
10.1	General .....	20
10.2	Environmental class A (Domestic use, indoor installations).....	21
10.3	Environmental class B (Domestic use, outdoor installations) .....	21
10.4	Environmental class C (Industrial installations) .....	21
10.5	Mechanical classes M1 to M3 .....	21
11	Heat meter specification .....	21
11.1	General .....	21
11.2	Flow sensor .....	21
11.3	Temperature sensor pair.....	23
11.4	Calculator.....	23
11.5	Complete meters.....	25
12	Information to be made available by the manufacturer or supplier .....	26
12.1	Installation instructions.....	26
12.2	Parameter setting instructions.....	27
12.3	Adjustment instructions .....	28
12.4	Maintenance instructions.....	28
12.5	Hints for disposal instructions .....	29
Annex A (normative) Heat coefficient equations .....		30
Annex B (normative) Flow conditioner package.....		32
Annex C (normative) Fast response meters.....		34
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2004/22/EC, MID.....		35
Bibliography .....		37

**EN 1434-1:2015 (E)****European foreword**

This document (EN 1434-1:2015) has been prepared by Technical Committee CEN/TC 176 “Heat meters”, the secretariat of which is held by SIS.

This 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 May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1434-1:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

EN 1434, *Heat meters* consists of the following parts:

- *Part 1: General requirements*
- *Part 2: Constructional requirements*
- *Part 3: Data exchange and interfaces<sup>1)</sup>*
- *Part 4: Pattern approval tests*
- *Part 5: Initial verification tests*
- *Part 6: Installation, commissioning, operational monitoring and maintenance*

In comparison to EN 1434-1:2007, the following changes have been made:

- special cases for combined cooling and heating meters are added;
- additional functionality for smart metering applications are added;
- metrological requirements for smart metering applications are added;
- definitions and requirements for the cooling meter are added;
- tariff meters are added;
- terms and definitions, requirements for registration devices and cooling meters are added;
- requirements for fast response meters are added (informative Annex C).

---

<sup>1)</sup> EN 1434-3 is maintained by CEN/TC 294.



According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## EN 1434-1:2015 (E)

### 1 Scope

This European Standard specifies the general requirements for heat meters. Heat meters are instruments intended for measuring the energy which in a heat-exchange circuit is absorbed (cooling) or given up (heating) 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 European Standard.

Pressure safety requirements are not covered by this European Standard.

Surface mounted temperature sensors are not covered by this European Standard.

This standard covers meters for closed systems only, where the differential pressure over the thermal load is limited.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1434-2:2015, *Heat meters — Part 2: Constructional requirements*

EN 1434-4:2015, *Heat meters — Part 4: Pattern approval test*

EN 60751, *Industrial platinum resistance thermometers and platinum temperature sensors (IEC 60751)*

EN 61010-1, *Safety requirements for electrical equipment for measurement, control and laboratory use — Part 1: General requirements (IEC 61010-1)*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1 response time

$\tau_{0,5}$

time interval between the instant when flow or temperature difference is subjected to a specified abrupt change and the instant when the response reaches 50 % of the step value

#### 3.2 fast response meter

meter suitable for heat exchanging circuits with rapid dynamic variations in the exchanged heat

Note 1 to entry: See also Annex C.

#### 3.3 rated voltage

$U_n$

voltage of the external power supply required to operate the heat meter, conventionally the voltage of the AC mains supply

#### 3.4 rated operating conditions

conditions of use, giving the range of values of influence quantities, for which the metrological characteristics of the instrument are within the specified maximum permissible errors

**3.5****reference conditions**

set of specified values of influence factors, fixed to ensure valid inter-comparison of results of measurements

**3.6****influence quantity**

quantity, which is not the subject of the measurement, but which influences the value of the measurement and or the indication of the measuring instrument

**3.7****influence factors**

influence quantity having a value within the rated operating conditions

**3.8****disturbance**

influence quantity having a value outside the rated operating conditions

**3.9****Types of errors****3.9.1****error (of indication)**

indication of the measuring instrument minus the conventional true value of the measurand

**3.9.2****intrinsic error**

error of a measuring instrument determined under reference conditions

**3.9.3****initial intrinsic error**

error of a measuring instrument as determined once prior to performance tests and durability tests

**3.9.4****durability error**

difference between the intrinsic error after a period of use and the initial intrinsic error

**3.9.5****maximum permissible error****MPE**

highest values of the error (positive or negative) permitted

**3.10****Types of faults****3.10.1****fault**

difference between the error of indication and the intrinsic error of the instrument

**3.10.2****transitory fault**

momentary variations in the indication, which cannot be interpreted, memorized or transmitted as measurements

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-