



BSI Standards Publication

Thermal energy meters

Part 5: Initial verification tests

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

National foreword

This British Standard is the UK implementation of EN 1434-5:2015+A1:2019. It supersedes BS EN 1434-5:2015, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee CPI/30, Measurement of fluid flow in closed conduits.

A list of organizations represented on this committee can be obtained on request to its secretary.

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

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 99371 8

ICS 17.200.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2015.

Amendments/corrigenda issued since publication

Date	Text affected
28 February 2019	Implementation of CEN amendment A1:2019

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

February 2019

ICS 17.200.10

Supersedes EN 1434-5:2015

English Version

Thermal energy meters - Part 5: Initial verification tests

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

Thermische Energiemessgeräte - Teil 5: Tests für
Konformitätsuntersuchungen und Eichungen

This European Standard was approved by CEN on 5 September 2015 and includes Amendment 1 approved by CEN on 5 February 2018.

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, Serbia, 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: Rue de la Science 23, B-1040 Brussels

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

Contents	Page
European foreword	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 General	5
5 Uncertainty of test equipment	6
6 Tests to be carried out	6
6.1 General	6
6.2 Flow sensors	6
6.3 Temperature sensor pair	7
6.3.1 Error in temperature difference	7
6.3.2 Insulation resistance	8
6.3.3 Single temperature sensor for smart metering applications	8
6.4 Calculator	8
6.5 Calculator and temperature sensor pair	9
6.5.1 Heating and cooling applications	9
6.5.2 Calculator with single temperature sensor for smart metering applications	9
6.6 Combined $\overline{A_1}$ thermal energy meter $\overline{A_1}$	9
6.7 Complete meter	9
7 Documentation to be supplied	10
Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2014/32/EU aimed to be covered	11

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

European foreword

This document (EN 1434-5:2015+A1:2019) has been prepared by Technical Committee CEN/TC 176 "Thermal energy 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 August 2019, and conflicting national standards shall be withdrawn at the latest by August 2019.

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

This document includes Amendment 1 approved by CEN on 5 February 2018.

This document supersedes A1 EN 1434-5:2015 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

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, *Thermal energy meters* consists of the following parts:

- *Part 1: General requirements*
- *Part 2: Constructional requirements*
- *Part 3: Data exchange and interfaces¹⁾*
- *Part 4: Pattern approval tests*
- *Part 5: Initial verification tests*
- *Part 6: Installation, commissioning, operational monitoring and maintenance*

In comparison to EN 1434-5:2007, the following changes have been made:

- metrological requirements for smart metering applications are added;
- additional functionalities for smart metering applications are added;
- bath constructions are added;
- tests for cooling applications are added;
- single temperature sensor for smart metering are added;

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

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

— test for bi-functional meters for change-over between heating and cooling are added.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

This is a preview of "BS EN 1434-5:2015+A1...". [Click here to purchase the full version from the ANSI store.](#)

1 Scope

This European Standard specifies initial verification tests for A_1 thermal energy meters A_1 . A_1 Thermal energy meters A_1 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 A_1 thermal energy meter A_1 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.

A_1 EN 1434-1:2015+A1:2018, *Thermal energy meters — Part 1: General requirements* A_1

A_1 EN 1434-4:2015+A1:2018, *Thermal Energy meters —Part 4: Pattern approval tests* A_1

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in A_1 EN 1434-1:2015+A1:2018 A_1 apply.

4 General

Initial verification of a measuring instrument is a series of tests and visual examinations carried out to determine whether an instrument manufactured to replicate a given pattern conforms to that pattern and to regulations, and that its metrological characteristics lie within the limits of the maximum permissible errors. If the instrument passes all tests and examinations, it is given legal character by its acceptance as evidenced by stamping and/or issuance of a certificate of verification.

The provisions of this standard also apply to the re-verification of A_1 thermal energy meters A_1 .

The instrument shall be tested under rated operating conditions at the extremes and midpoints of its ranges.

Initial verification is divided into metrological, technical and administrative phases.

In tests of a A_1 thermal energy meter A_1 as a combined instrument, the flow sensor, the temperature sensors and the calculator shall each be tested separately.

Unless otherwise stated in the certificate of pattern approval, the verification shall be carried out in accordance with this standard.

NOTE Modern A_1 thermal energy meters A_1 are mainly equipped with CMOS microprocessors with a very low power consumption, allowing battery operation. Testing and adjusting of this type of meter needs a completely different approach. Until now, almost every meter type needed its own test equipment to handle the manufacturer's specific requirements. This is a very complicated and expensive way for users of several types of meters and for initial verification institutes. The more different types of A_1 thermal energy meters A_1 a user has