

ICS 17.200.10

English Version

Installation of thermal energy meters - Guidelines for the selection, installation and operation of thermal energy meters

Compteur d'énergie thermique installation - Lignes directrices pour la sélection, l'installation et le fonctionnement des compteurs d'énergie thermique

Installation von thermischen Energiemessgeräten - Richtlinien für Auswahl, Installation und Betrieb von thermischen Energiemessgeräten

This Technical Report was approved by CEN on 4 January 2021. It has been drawn up by the Technical Committee CEN/TC 176.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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

Contents	Page
European foreword	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	6
4 Selecting a metering device for thermal energy	7
4.1 General.....	7
4.2 Metrological characteristics	8
4.3 Environmental classifications.....	8
5 Dimensioning	9
5.1 General.....	9
5.2 Determining the thermal energy power.....	9
5.3 Thermal energy load	9
5.4 Thermal energy power for water heating.....	10
5.5 Thermal energy power for ventilation and air conditioning systems.....	11
5.6 Thermal energy power for cooling systems.....	11
5.7 Thermal energy power for engineering purposes.....	11
6 Determining the flow rate	12
6.1 Principles of thermodynamics	12
7 Selecting a flow sensor for a thermal energy meter.....	13
8 Checking the flow sensor design after commissioning	14
8.1 General.....	14
8.2 Operating conditions	14
8.3 Flow sensors	15
8.4 Temperature sensors	20
8.5 Calculators.....	23
9 Arranging of meters for thermal energy	24
9.1 General.....	24
9.2 Environment.....	24
9.3 Flow sensors	25
9.4 Temperature sensors	28
9.5 Calculators.....	32
10 Installing thermal energy meters	33
10.1 General.....	33
10.2 Mechanics	33
10.3 Connecting to pipes.....	33
10.4 Electrical connections	33
10.5 Commissioning	34
11 Monitoring operation.....	34
11.1 General.....	34
11.2 Measuring cooling supply using water or anti-freeze mixtures as medium	34
11.3 Requirements for the system arrangement of cooling measurements.....	39

12	Other liquids than water	42
12.1	Introduction	42
12.2	Physical impact.....	42
12.3	Flow measurement	44
12.4	Temperature difference measurement.....	49
12.5	Calculator	49
	Bibliography	50

European foreword

This document (CEN/TR 13582:2021) has been prepared by Technical Committee CEN/TC 176 “Thermal energy meters”, the secretariat of which is held by SIS.

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 is a preview generated by EVS

Introduction

Metering devices for thermal energy (heat and cooling meters) are only working correctly and consistently if the system design considers the minimum and maximum ratings for temperature, temperature difference and flow rate according to the approved ranges. The metering device should be selected for the approved legal range and the application area. The thermal energy meter should be installed according to the valid requirements. During commissioning the thermal energy meter is checked for both correct installation and full functionality and afterwards sealed against unauthorized opening.

According to the European harmonized standard EN 1434-6 a commissioning is obligatory to ensure that the metering device accurately measures the planned or predicted consumption.

Installing the metering devices or their sub-assemblies incorrectly (e.g. an incorrect combination of temperature sensors with non-approved pockets) does not guarantee the measuring accuracy. Hence, the measurement deviations may exceed the permissible error limits. National calibration laws state that the metering point operator should ensure that the metering device is set up, connected, handled and maintained correctly to guarantee the measuring accuracy. Incorrect measurements result in bills that cannot be used in business transactions.

The metering point operator in district heating networks is responsible for a proper installation and commissioning of the metering devices. The metering point operator can also delegate this task to a service company. The building owner or the building owner's representative (e.g. a metering service company) is in sub metering applications responsible for a proper installation and commissioning of the metering devices.

The EN 1434 standards provide technical principles and practical advice in selecting, installing and commissioning of thermal energy meters. However, because a standard cannot cover all areas completely, this report shall assist users of thermal energy meters.

1 Scope

The EN 1434 standards provide technical principles and practical advice in selecting, installing and commissioning of thermal energy meters. However, because a standard cannot cover all areas completely, this document assists users of thermal energy meters.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1434-1, *Thermal energy meters - Part 1: General requirements*

EN 1434-2, *Thermal energy meters - Part 2: Constructional requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1434-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

DH (network)

district heating system, DC: district cooling system

3.2

meter: thermal energy meter

heat meter or cooling meter

3.3

water

domestic water

3.4

hot water

domestic hot water

3.5

fluid additive

fluid used to supplement a shortage of the heat transfer medium due to leaks

3.6

fluid

heat transfer medium in a DH/DC system

3.7

MID

Measurement Instrument Directive 2014/32/EU