



# SLOVENSKI STANDARD

## oSIST prEN 1434-2:2020

01-november-2020

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### Merilniki toplote - 2. del: Konstruktivske zahteve

Thermal energy meters - Part 2: Constructional requirements

Thermische Energiemessgeräte - Teil 2: Anforderungen an die Konstruktion

Compteurs d'énergie thermique - Partie 2 : Prescriptions de fabrication

Ta slovenski standard je istoveten z: prEN 1434-2

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#### ICS:

17.200.20	Instrumenti za merjenje temperature	Temperature-measuring instruments
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 1434-2**

November 2020

ICS 17.200.20

Will supersede EN 1434-2:2015+A1:2018

English Version

## Thermal energy meters - Part 2: Constructional requirements

Compteurs d'énergie thermique - Partie 2 :  
Prescriptions de fabrication

Thermische Energiemessgeräte - Teil 2:  
Anforderungen an die Konstruktion

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 176.

If this draft becomes a European Standard, 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.

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 1434-2:2020****European foreword**

This document (prEN 1434-2:2020) has been prepared by Technical Committee CEN/TC 176 “Thermal energy meters”, the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

This document supersedes EN 1434-2:2015+A1:2018.

EN 1434-2, *Thermal energy 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 1434-2:2015+A1:2018, the following changes have been made:

- Figure A.10 “Threaded pipe fitting G1/2B, G3/4B, G1B, G1 1/4B and G1 1/2B sizes” was updated;
- in subclause 4.2.2 “Materials of temperature probe sheath and pocket” another suitable material was added.

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

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

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

## 1 Scope

This document specifies the constructional requirements for thermal energy meters. Thermal energy 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 thermal energy meter indicates the quantity of thermal energy in legal units.

Electrical safety requirements are not covered by this document.

Pressure safety requirements are not covered by this document.

Surface mounted temperature sensors are not covered by this document.

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

## 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 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

prEN 1434-1:2020, *Thermal energy meters — Part 1: General requirements*

prEN 1434-3:2020, *Thermal energy meters — Part 3: Data exchange and interfaces*

prEN 1434-4:2020, *Thermal energy meters — Part 4: Pattern approval tests*

EN 60751:2008, *Industrial platinum resistance thermometers and platinum temperature sensors (IEC 60751:2008)*

EN 60947-5-6, *Low-voltage switchgear and controlgear — Part 5-6: Control circuit devices and switching elements — DC interface for proximity sensors and switching amplifiers (NAMUR) (IEC 60947-5-6)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

ISO 4903, *Information technology — Data communication — 15-pole DTE/DCE interface connector and contact number assignments*

**prEN 1434-2:2020****3 Terms and definitions**

For the purposes of this document, the terms and definitions given in prEN 1434-1:2020 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 <http://www.iso.org/obp>

**4 Temperature sensors****4.1 General**

The temperature sensor sub-assembly shall consist of platinum resistance temperature sensors selected as matched pairs.

Other types of temperature sensor pairs may be used, where the sub-assembly consists, inseparably, of temperature sensors and calculator.

The maximum admissible working pressure shall be declared by the manufacturer.

Where no dimensional tolerance is specified, the values shall be taken from Table 1.

**Table 1 — Tolerances**

Dimension mm	0,5 up to 3	over 3 up to 6	over 6 up to 30	over 30 up to 120	over 120 up to 400
Tolerance mm	±0,2	±0,3	±1	±1,5	±2,5

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**4.2 Mechanical design****4.2.1 General**

For pipe sizes up to and including DN 250, 3 different temperature sensor types are standardized:

- direct mounted short probes - Type DS;
- direct mounted long probes - Type DL;
- pocket mounted long probes - Type PL.

Types PL and DL can be either head probes or have permanently connected signal leads. Type DS shall have permanently connected signal leads only.

**4.2.2 Materials of temperature probe sheath and pocket**

The temperature pocket and the protective sheath of direct mounted probes shall be of a material that is adequately strong and resistant to corrosion and has the requisite thermal conductivity.



Examples of suitable materials are:

EN 10088-3 – X2 Cr Ni Mo 17 13 2 (also known as W.nr. 1.4404)

or

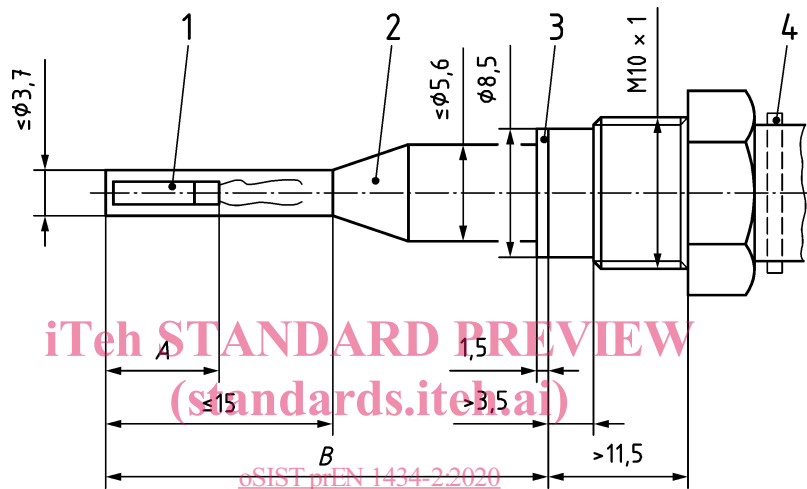
EN 10088-3 – X6 Cr Ni Mo Ti 17 12 2 (also known as W.nr. 1.4571)

#### 4.2.3 Dimensions of direct mounted short probes - Type DS

The dimensions shall be as given in Figure 1.

Further non-normative information is given in Annex A, Figure A.1. The qualifying immersion depth shall be 20 mm – or less if so specified by the manufacturer.

Dimensions in millimetres



#### Key

- 1 temperature sensing element
- 2 protective sheath
- 3 sealing ring
- 4 ejection device

A: < 15 mm

B: = 27,5 mm or = 38 mm or = 60 mm

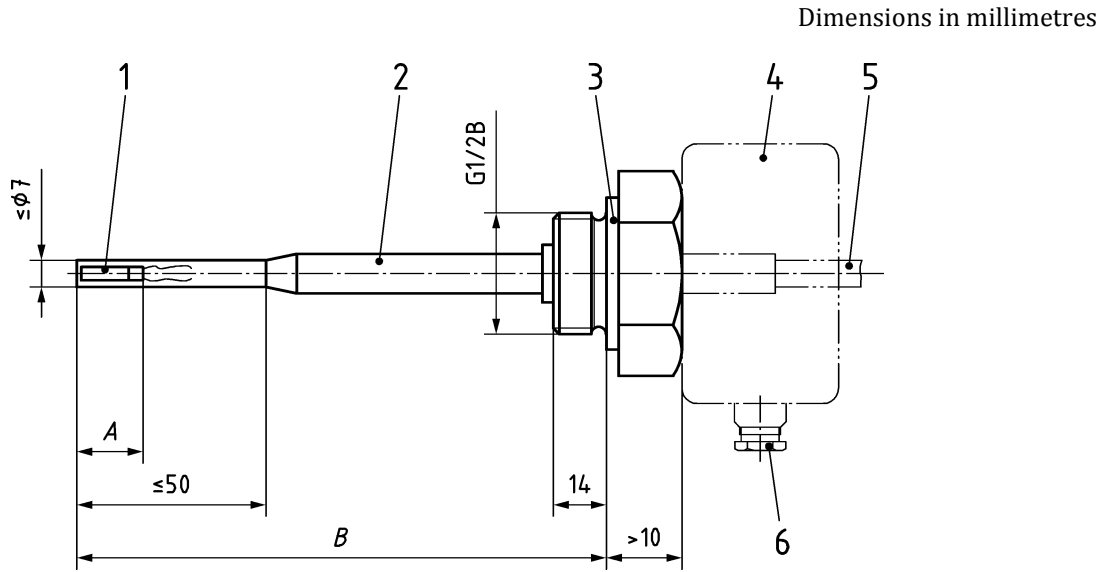
Figure 1 — Temperature probes type DS

#### 4.2.4 Dimensions of direct mounted long probes - Type DL

The dimensions shall be as given in Figure 2.

Further information is given in Annex A, Figures A.2 and A.3.

The qualifying immersion depth shall be 50 % of the length B – or less if so specified by the manufacturer.



**Key**

- 1 temperature sensing element
- 2 protective sheath
- 3 sealing surface
- 4 outline of head probe
- 5 outline of permanently connected signal lead probe
- 6 inlet for signal cable –  $\phi \leq 9$  mm

G 1/2 B thread in accordance with EN ISO 228-1

A: < 30 mm or  $\leq 50$  mm for Pt1000

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Alternative lengths	
B	C (head probe only)
85	105
120	140
210	230

**Figure 2 — Temperature probes type DL (head or cable)**

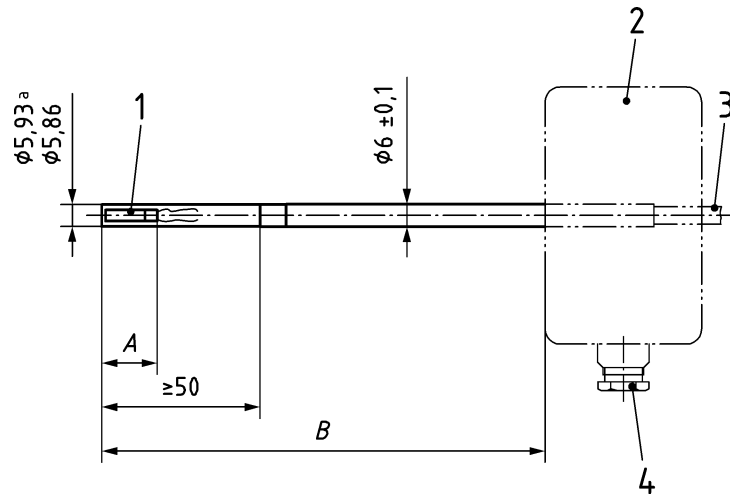
**4.2.5 Dimensions of pocket mounted long probes - Type PL**

The dimensions shall be as given in Figure 3.

Further information is given in Annex A, Figures A.4 and A.5.

The qualifying immersion depth shall be 50 % of the length B for the shortest pocket specified – or less if so specified by the manufacturer.

Dimensions in millimetres

**Key**

A < 30 mm or  $\leq 50$  mm for Pt 1 000

Alternative lengths
B (head probe only)
105
140
230

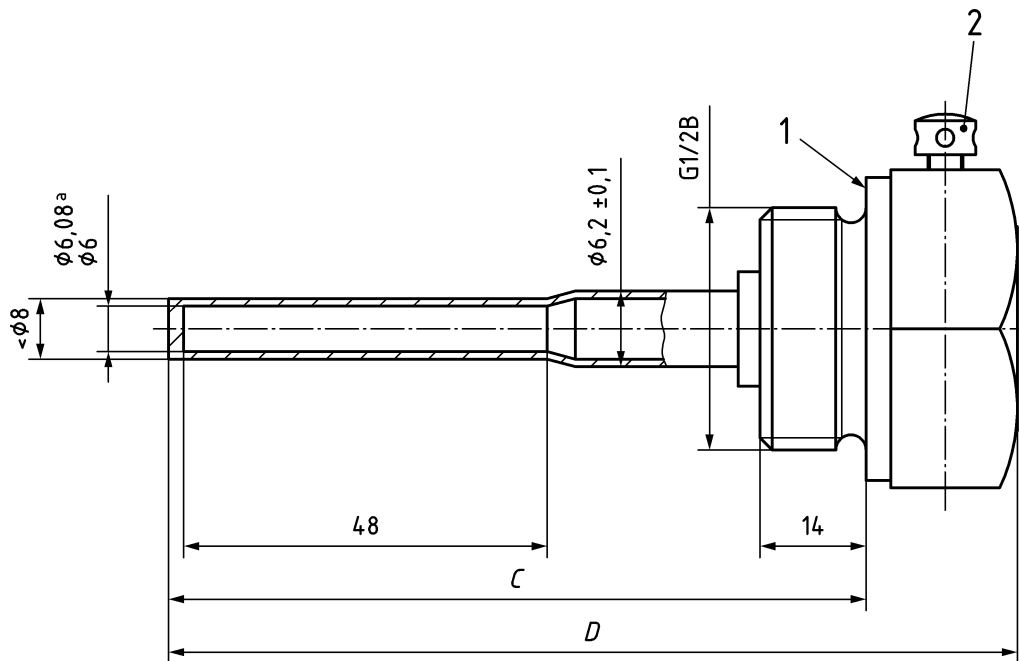
- 1 temperature sensing element  
 2 outline of head probe  
 3 outline of permanently connected signal lead probe  
 4 inlet for signal cable -  $\varnothing \leq 9$  mm
- Corresponding to c11 in EN ISO 286-2, rounded to 2 decimals

**Figure 3 — Temperature probes - Type PL (head or cable)**

#### 4.2.6 Dimensions of temperature pocket

The temperature pocket is designed for use with type PL temperature probes only. It is designed to be capable of being inserted through a pipe wall to which has been externally brazed or welded a boss (see Annex A, Figure A.9) and in this respect only, it is interchangeable with a direct mounted long probe of corresponding insertion length. The dimensions shall be as given in Figure 4.

Dimensions in millimetres

**Key**

- 1 sealing face
- 2 probe clamping screw with provision for security sealing

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a Corresponding to H11 in EN ISO 286-2 rounded to 2 decimals

G 1/2 B thread in accordance with EN ISO 228-1

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Alternative lengths	
C	D
85	$\leq 100$
120	$\leq 135$
210	$\leq 225$

**Figure 4 — Temperature pocket**

#### 4.2.7 Design of short probes with respect to installation

The sensor shall be mounted perpendicular to the flow and with the sensing element inserted to at least the centre of the pipe.

For internal pressures up to 16 bar, the sensor shall be designed to fit in a pipe fitting (see Annex A, Figure A.10).

#### 4.2.8 Design of long probes with respect to installation

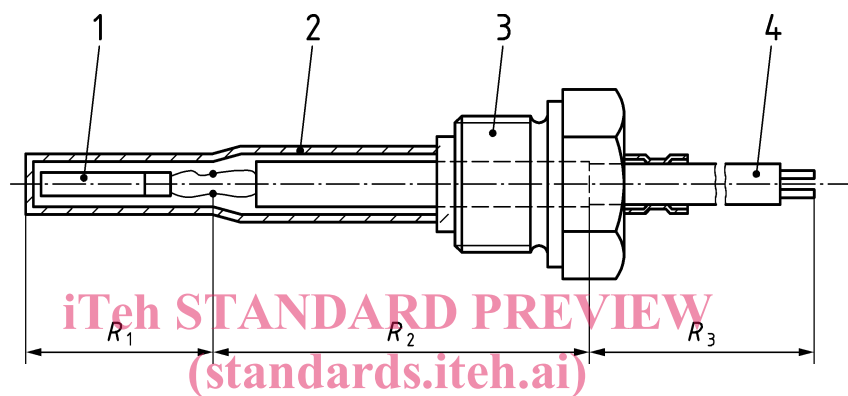
The sensor shall be mounted with the sensing element inserted to at least the centre of the pipe.

The sensor shall be designed to fit in the following types of installation, (for internal pressures up to PN 16):

- a) in a pipe DN 50 mounted with the tip pointing into the flow in a bend (see Annex A, Figure A.12 b), using welded-in boss (see Annex A, Figure A.9);
- b) in a pipe DN 50 mounted at an angle  $45^\circ$  to the direction of the flow with the tip pointing into the flow (see Annex A, Figure A.12 c), using a welded-in boss (see Annex A, Figure A.9);
- c) in a pipe DN 65 to DN 250, mounted perpendicular to the flow (see Annex A, Figure A.12 d), using a welded-in boss (see Annex A, Figure A.9).

### 4.3 Platinum temperature sensor

#### 4.3.1 Specialized definitions for 2 wire temperature probes



#### Key

$R_1$	temperature sensing element resistance	1	temperature sensing element
$R_2$	internal wire resistance	2	protective sheath
$R_3$	signal lead resistance	3	mounting thread
		4	signal leads

Figure 5 — Temperature probe with permanently connected signal leads