

**Hoonete küttesüsteemid. Vesiküttesüsteemide  
projekteerimine**

**Heating systems in buildings - Design for water-based  
heating systems**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 12828:2012+A1:2014 sisaldab Euroopa standardi EN 12828:2012+A1:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 12828:2012+A1:2014 consists of the English text of the European standard EN 12828:2012+A1:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.04.2014.	Date of Availability of the European standard is 02.04.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

## Heating systems in buildings - Design for water-based heating systems

Systèmes de chauffage dans les bâtiments - Conception  
des systèmes de chauffage à eau

Heizungsanlagen in Gebäuden - Planung von  
Warmwasser-Heizungsanlagen

This European Standard was approved by CEN on 6 October 2012 and includes Amendment 1 approved by CEN on 12 January 2014.

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
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## Foreword



This document (EN 12828:2012+A1:2014) has been prepared by Technical Committee  CEN/TC 228 "Heating systems and water based cooling systems in buildings" , the secretariat of which is held by DIN.



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of an identical text or by endorsement, at the latest by October 2014, and conflicting national standards shall be withdrawn at the latest by October 2014.

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 includes Amendment 1 approved by CEN on 12 January 2014.

This document supersedes  EN 12828:2012 .

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

The main changes  between EN 12828:2003 and EN 12828:2012 were .

- restrictions concerning additional safety requirements for systems larger than 1 MW were removed;
- an informative annex for safety valves was added;
- definitions were corrected and added;
- the guidance for dimensioning of diaphragm expansion vessels (sealed systems) in Annex D was revised, and a figure describing the different pressure level was added;
- a specification for the water used has been added in 4.3.2.1;
- the requirements concerning safety arrangements (4.6) were revised and clarified;
- 4.7.4 concerning pressure maintaining control device was revised.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

The subjects covered by CEN/TC 228 are the following:

- design of heating systems (water based, electrical, etc.);
- installation of heating systems;
- commissioning of heating systems;
- instructions for operation, maintenance and use of heating systems;
- methods for calculation of the design heat loss and heat load;
- methods for calculation of the energy performance of heating systems.

Heating systems also include the effect of attached systems such as hot water production systems.

All these standards are system standards, i.e. they are based on requirements addressed to the system as a whole and not dealing with requirements to the products within the system.

Where possible, reference is made to other CEN or ISO standards, e.g. product standards. However, use of products complying with relevant product standards is no guarantee of compliance with the system requirements.

The requirements are mainly expressed as functional requirements, i.e. requirements dealing with the function of the system and not specifying shape, material, dimensions or the like.

The guidelines describe ways to meet the requirements, but other ways to fulfil the functional requirements may be used if fulfilment can be proved.

Heating systems differ among the member countries due to climate, traditions and national regulations. In some cases, requirements are given as classes so national or individual needs may be accommodated.

In cases where the standards contradict with national regulations, the latter should be followed.

## 1 Scope

This European Standard specifies design criteria for water based heating systems in buildings with a maximum operating temperature of up to 105 °C. In case of heating systems with maximum operating temperatures over 105 °C other safety aspects than those described in 4.6 may apply. The other clauses of this European Standard are still valid for those systems.

This European Standard does not amend product standards or product installation requirements. This standard covers the design of:

- heat supply systems;
- heat distribution systems;
- heat emission systems;
- control systems.

This European Standard takes into account heating requirements of attached systems (e.g. domestic hot water, process heat, air conditioning, ventilation) in the design of a heat supply, but does not cover the design of these systems.

This European Standard does not cover requirements for installation or commissioning or instructions for operation, maintenance and use of water based heating systems.

This European Standard does not cover the design of fuel and energy supply systems.

## 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 215, *Thermostatic radiator valves — Requirements and test methods*

EN 442-1, *Radiators and convectors — Part 1: Technical specifications and requirements*

EN 442-2, *Radiators and convectors — Part 2: Test methods and rating*

EN 442-3, *Radiators and convectors — Part 3: Evaluation of conformity*

EN 806-2, *Specifications for installations inside buildings conveying water for human consumption — Part 2: Design*

EN 1264-1, *Water based surface embedded heating and cooling systems — Part 1: Definitions and symbols*

EN 1264-2, *Water based surface embedded heating and cooling systems — Part 2: Floor heating: Prove methods for the determination of the thermal output using calculation and test methods*

EN 1264-3, *Water based surface embedded heating and cooling systems — Part 3: Dimensioning*

EN 1264-4, *Water based surface embedded heating and cooling systems — Part 4: Installation*

EN 1264-5, *Water based surface embedded heating and cooling systems — Part 5: Heating and cooling surfaces embedded in floors, ceilings and walls — Determination of the thermal output*

EN 12170, *Heating systems in buildings — Procedure for the preparation of documents for operation, maintenance and use — Heating systems requiring a trained operator*

EN 12171, *Heating systems in buildings — Procedure for the preparation of documents for operation, maintenance and use — Heating systems not requiring a trained operator*

EN 12831, *Heating systems in buildings — Method for calculation of the design heat load*

EN 14336, *Heating systems in buildings — Installation and commissioning of water based heating systems*

EN 15500, *Control for heating, ventilating and air-conditioning applications — Electronic individual zone control equipment*

EN 60730-2-9, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 730-2-9, modified)*

EN ISO 7730, *Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria (ISO 7730)*

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

### 3 Terms, definitions and symbols

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

#### 3.1 Terms and definitions

##### 3.1.1

##### **attached system**

system connected to the heating system which may influence the design and heat load of the system

EXAMPLE Examples of such systems include:

- domestic hot water systems;
- ventilation and air conditioning systems;
- process heating systems

##### 3.1.2

##### **central control**

method of controlling the heat flow to a heat emission system by changing the flow rate and/or the flow temperature at a central point

##### 3.1.3

##### **design heat load**

maximum heat output required from the heating system of a building, in order to maintain required internal temperatures without supplementary heating

[SOURCE: EN ISO 15927-5:2004, 3.1.1]

##### 3.1.4

##### **design heat loss**

quantity of heat per unit time leaving the building to the external environment under specified design conditions