

## საქართველოს სტანდარტი

---

სსკ: 27.080; 27.200

გაცივების სისტემები და სითბური ტუმბოები- წნევის შემზღვეველი მოწყობილობა და მასთან დაკავშირებული მილსადენები-გაანგარიშების მეთოდები

სსტ ენ 13136:2013/A1:2018/2021

საინფორმაციო მონაცემები

1 დამტკიცებულია და შემოღებულია სამოქმედოდ საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს 04/10/2021 წლის № 59 განკარგულებებით

2 მიღებულია თავფურცლის თარგმნის მეთოდით სტანდარტიზაციის ევროპული კომიტეტის სტანდარტი ენ 13136:2013/A1:2018 „ გაცივების სისტემები და სითბური ტუმბოები- წნევის შემზღვეველი მოწყობილობა და მასთან დაკავშირებული მილსადენები-გაანგარიშების მეთოდები”

3 ნაცვლად: სსტ ენ 13136:2013/2015

4 რეგისტრირებულია საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს რეესტრში: 04/10/2021 წლის №268-1.3-021197

აკრძალულია ამ სტანდარტის გადაცემა მესამე პირებისათვის ან/და მისი სხვა ფორმით გავრცელება

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.

English Version

Refrigerating systems and heat pumps - Pressure relief  
devices and their associated piping - Methods for  
calculation

Systèmes frigorifiques et pompes à chaleur - Dispositifs  
de limitation de pression et tuyauteries associées -  
Méthodes de calcul

Kälteanlagen und Wärmepumpen -  
Druckentlastungseinrichtungen und zugehörige  
Leitungen - Berechnungsverfahren

This European Standard was approved by CEN on 24 August 2013 and includes Amendment 1 approved by CEN on 5 November 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

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
<b>1 Scope</b> .....	<b>6</b>
<b>2 Normative references</b> .....	<b>6</b>
<b>3 Terms and definitions</b> .....	<b>7</b>
<b>4 Symbols</b> .....	<b>7</b>
<b>5 General</b> .....	<b>9</b>
<b>6 Pressure relief devices for protection of system components</b> .....	<b>10</b>
<b>6.1 General</b> .....	<b>10</b>
<b>6.2 Excessive pressure caused by heat sources</b> .....	<b>10</b>
<b>6.2.1 External heat sources</b> .....	<b>10</b>
<b>6.2.2 Internal heat sources</b> .....	<b>11</b>
<b>6.3 Excessive pressure caused by compressors</b> .....	<b>12</b>
<b>6.4 Excessive pressure caused by liquid expansion</b> .....	<b>12</b>
<b>7 Discharge capacities of pressure relief devices</b> .....	<b>12</b>
<b>7.1 General</b> .....	<b>12</b>
<b>7.2 Determination of pressure relief valve performance</b> .....	<b>13</b>
<b>7.2.1 Determination of coefficient of discharge</b> .....	<b>13</b>
<b>7.2.2 Critical and sub-critical flow</b> .....	<b>13</b>
<b>7.2.3 Function of the isentropic exponent (<i>C</i>)</b> .....	<b>13</b>
<b>7.2.4 Correction factor for sub-critical flow</b> .....	<b>13</b>
<b>7.2.5 Discharge capacity of pressure relief valves</b> .....	<b>14</b>
<b>7.3 Calculation of capacity and flow area of bursting discs or fusible plugs</b> .....	<b>14</b>
<b>7.4 Pressure loss in upstream/downstream lines</b> .....	<b>15</b>
<b>7.4.1 General</b> .....	<b>15</b>
<b>7.4.2 Pressure loss in components</b> .....	<b>15</b>
<b>7.4.3 Pressure loss in the upstream line</b> .....	<b>16</b>
<b>7.4.4 Pressure loss in the downstream line</b> .....	<b>16</b>
<b>Annex A (normative) Values of functions, factors and properties of refrigerants</b> .....	<b>17</b>
<b>Annex B (informative) Calculation of flow areas for non-evaporating and evaporating liquids</b> .....	<b>26</b>
<b>B.1 Calculation of the flow area for non-evaporating liquids</b> .....	<b>26</b>
<b>B.2 Calculation of the flow area for evaporating liquids</b> .....	<b>26</b>
<b>Annex C (informative) Example of calculation for sizing pressure relief devices with the corresponding pipes</b> .....	<b>28</b>
<b>C.1 Assumptions for the calculation example</b> .....	<b>29</b>
<b>C.2 Calculation of the required minimum discharge capacity, <math>Q_{md}</math> at standard heat flow rate</b> .....	<b>29</b>
<b>C.3 Calculation of the required minimum discharge capacity <math>Q_{md}</math> at reduced heat flow rate</b> .....	<b>30</b>
<b>C.4 Calculation of flow area <math>A_c</math>, selection of pressure relief valve</b> .....	<b>30</b>

საინფორმაციო ნაწილი. სრული ტექსტის სახსრავად შეიძინეთ სტანდარტი.

C.5 Pressure loss in upstream line (from vessel to pressure relief valve)..... 31  
C.6 Pressure loss in downstream line (from pressure relief valve to atmosphere)..... 32  
Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2014/68/EU (Pressure equipment Directive) aimed to be covered ..... 34  
Bibliography ..... 35

## European foreword

This document (EN 13136:2013+A1:2018) has been prepared by Technical Committee CEN/TC 182 “Refrigerating systems, safety and environmental requirements”, 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 May 2019, and conflicting national standards shall be withdrawn at the latest by May 2019.

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 2018-11-05.

This document supersedes **A1** EN 13136:2013 **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(s).

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

**A1** Compared to EN 13136:2013, EN 13136:2013+A1:2018 takes into account changes in Annex A and Annex C. **A1**

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.

საინფორმაციო ნაწილი. სრული ტექსტის სახასიათოდ შეიძინეთ სტანდარტი.

## Introduction

This European Standard is based on applicable parts of EN ISO 4126-1:2013, EN ISO 4126-2:2003 and EN 12284.

It is suited to the specific requirements, and includes the data, of refrigerating systems. It provides means of satisfying the pressure relief devices requirements of EN 378-2:2008+A2:2012.