SLOVENSKI STANDARD
SIST EN 12178:2017

01-januar-2017

Nadomešča:
SIST EN 12178:2004

Hladilni sistemi in toplotne črpalke - Naprave, ki označujejo nivo tekočine - Zahteve, preskušanje in označevanje

Refrigerating systems and heat pumps - Liquid level indicating devices - Requirements, testing and marking

Kälteanlagen und Wärmepumpen - Flüssigkeitsstandanzeiger - Anforderungen, Prüfung und Kennzeichnung

Systèmes de réfrigération et pompes à chaleur - Indicateurs de liquide - Exigences, essais et marquage

Ta slovenski standard je istoveten z: **EN 12178:2016**

ICS:

27.080	Toplotne črpalke	Heat pumps
27.200	Hladilna tehnologija	Refrigerating technology

SIST EN 12178:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12178

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ICS 27.080; 27.200

Supersedes EN 12178:2003

English Version

Refrigerating systems and heat pumps - Liquid level indicating devices - Requirements, testing and marking

Systèmes de réfrigération et pompes à chaleur - Indicateurs de liquide - Exigences, essais et marquage

Kälteanlagen und Wärmepumpen - Flüssigkeitsstandanzeiger - Anforderungen, Prüfung und Kennzeichnung

This European Standard was approved by CEN on 8 August 2016.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 12178:2016) has been prepared by 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of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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 supersedes EN 12178:2003.

EN 12178:2016 includes the following significant technical changes with respect to EN 12178:2003:

a) Introduction of the safety factors in 7.2.1;

b) Harmonisation of Annex ZA with Directive 2014/68/EU.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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.

1 Scope

This European Standard specifies safety requirements, safety factors, test methods, test pressures and marking of liquid level indicating devices, referred to throughout this standard as “level indicators”, for use in refrigerating systems and heat pumps.

It applies to devices connected to refrigerant vessels (e.g. on high-pressure liquid receivers, intercoolers and low-pressure receivers) and to devices connected to other parts of a refrigerating system (e.g. oil-level sight glasses on a compressor).

This European Standard applies to those types of level indicators that are direct and indirect reading devices (e.g. sight glasses, frosting tubes), and includes electrical and pneumatic indicators.

This European Standard describes the procedure to be followed when designing (by calculation or by an experimental design method) level indicator parts subjected to pressure as well as the criteria to be used for the selection of materials.

This European Standard applies to the design of level indicators with respect to pressure containment and describes methods by which the reduced impact values at lower temperatures may be taken into account in a safe manner.

It also gives guidance on some aspects of application and installation.

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 378-1, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Basic requirements, definitions, classification and selection criteria*

EN 378-2, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

EN 378-4, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 4: Operation, maintenance, repair and recovery*

EN 764-1, *Pressure equipment — Part 1: Vocabulary*

EN 12284:2003, *Refrigerating systems and heat pumps — Valves — Requirements, testing and marking*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 378-1 and EN 764-1 and the following apply.

3.1
min $t_{0\,100}$
lowest temperature at which pressurized parts can be used at a load of up to 100 % of the allowable design stress at 20 °C, taking the safety factors according to EN 12284:2003, Table A.2 into account

3.2
min $t_{0\,75}$
lowest temperature at which pressurized parts can be used, if its load amounts to 75 % maximum of the allowable design stress at 20 °C, taking the safety factors according to EN 12284:2003, Table A.2 into account

3.3
min $t_{0\,25}$
lowest temperature at which pressurized parts can be used, if their load amounts to 25 % maximum of the allowable design stress at 20 °C, taking the safety factors according to EN 12284:2003, Table A.2 into account

3.4
self-closing balls
self-closing shut-off arrangement

Note 1 to entry: The arrangement comprises balls positioned in the connecting channel close to the sight glass in such a manner that the balls will not be affected at low flow rates. At high flow rates the balls will be carried forward with the flow and block the connections to the sight glass.

3.5
reflex glass
glasses having prismatic flutes on the inside, which will break up the incoming light

Note 1 to entry: The liquid zone will absorb the light and will correspondingly appear dark. The gas/vapour zone will reflect the light and will correspondingly appear bright.

3.6
direct reading level indicator
level indicator where it is possible to see the liquid level

3.7
indirect reading level indicator
level indicator where the liquid level is not visible

Note 1 to entry: The level is indicated by auxiliary means; electrically, magnetically or by observing the frost on a tube.

3.8
self-contained unit
level indicator which is assembled and tested by the manufacturer

3.9
add-on unit
level indicator delivered in parts from the manufacturer for mounting directly onto the system and which can only be tested after assembly and connection on site

3.10
level indicator with magnetically operated indication
device which transfers the measured value at any particular moment to an indicating device by means of a float with a built-in permanent magnet system

3.11
sight glass
direct reading level indicator consisting of a glass plate and holder to enable viewing of the liquid surface

Note 1 to entry: The shape of the glass plate can be either circular or oblong. The glass can be smooth or provided with flutes to break up incoming light which will make the liquid-filled part darker than the vapour-filled part. A sight glass can be a self-contained or add-on unit.

3.12
frosting tube
device, the principle of which is based on the frosting of the humidity of the surrounding air, and which consists of a corrosion protected tube arranged vertically outside the vessel and connected to the vessel at top and bottom. It is especially suitable for refrigerant temperatures below – 3° C and ambient temperature above freezing point. The top level of the frosting on the tube will indicate the liquid level in the vessel

3.13
auxiliary powered level indicator
device which operates electrically or pneumatically to indicate the level by means such as the following:

a) differential pressure transducer;

b) capacitive transducer;

c) inductive transducer;

d) ultrasonic transducer;

e) displacement principle with a displacement float

3.14
operating range
temperature and pressure conditions at which the liquid level can be safely operated

3.15
nominal size [DN]
alpha-numeric designation of size for components of a pipework system

[SOURCE: EN ISO 6708:1995]

3.16
nominal pressure (PN)
value of a pressure in the range of the maximum allowable pressure for planning a plant or a component

[SOURCE: ISO 7268]

4 List of Symbols

For symbols, see EN 12284:2003, Clause 4 (Table 1).

5 General requirements

5.1 Installation and operation

Level indicators shall be designed for installation and operation in accordance with EN 378-1, EN 378-2 and EN 378-4.