# SLOVENSKI STANDARD
# SIST EN 12693:2026

**01-september-2026**

---

**Hladilni sistemi in toplotne črpalke - Varnostnotehnične in okoljevarstvene zahteve - Kompresorji za hladilne tekočine z iztiskavanjem**

Refrigerating systems and heat pumps - Safety and environmental requirements - Positive displacement refrigerant compressors

Kälteanlagen und Wärmepumpen - Sicherheitstechnische und umweltrelevante Anforderungen - Verdrängerverdichter für Kältemittel

Systèmes de réfrigération et pompes à chaleur - Exigences de sécurité et d'environnement - Compresseurs volumétriques pour fluides frigorigènes



**Ta slovenski standard je istoveten z:** **EN 12693:2026**

---

**ICS:**

| | | |
|---|---|---|
| 23.140 | Kompresorji in pnevmatični stroji | Compressors and pneumatic machines |
| 27.080 | Toplotne črpalke | Heat pumps |
| 27.200 | Hladilna tehnologija | Refrigerating technology |

**SIST EN 12693:2026** **en,fr,de**

# EUROPEAN STANDARD
# NORME EUROPÉENNE
# EUROPÄISCHE NORM

**EN 12693**

June 2026

ICS 23.140

Supersedes EN 12693:2008

English Version

# Refrigerating systems and heat pumps - Safety and environmental requirements - Positive displacement refrigerant compressors

Systèmes de réfrigération et pompes à chaleur - Exigences de sécurité et d'environnement - Compresseurs volumétriques pour fluides frigorigènes

Kälteanlagen und Wärmepumpen - Sicherheitstechnische und umweltrelevante Anforderungen - Verdrängerverdichter für Kältemittel

This European Standard was approved by CEN on 16 February 2026.

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, 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, Türkiye 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**



Ref. No. EN 12693:2026 E

# Contents

Page

## European foreword

This document (EN 12693:2026) 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 December 2026, and conflicting national standards shall be withdrawn at the latest by December 2026.

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 supersedes EN 12693:2008.

EN 12693:2026 includes the following significant technical changes with respect to EN 12693:2008:

a) normative references updated;

b) thermal hazards added to Clause 4, Table 2;

c) requirements on vibration added in 5.6;

d) requirements for spacings in 5.7.4, Table 3 adjusted;

e) NOTE in 6.2.3 transferred to normative text;

f) requirements for testing in 6.3.4 modified;

g) editorially revised including the rearrangement of the Annexes and introducing the new Annex G.



This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, 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, Türkiye and the United Kingdom.

# Introduction

This document is a type C standard as stated in EN ISO 12100:2010.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

# 1 Scope

This document is applicable to positive displacement refrigerant compressors for stationary and mobile refrigerating systems and heat pumps, hereafter called compressors.

It is applicable for compressors used in commercial and industrial appliances and with electrical energy supply including integral motors, up to 1 000 VAC and 1 500 VDC.

It is applicable to open drive, semi hermetic and hermetic motor compressors, which contain a positive compression function.

This document is not applicable to:

— compressors used in household appliance for which EN IEC 60335-2-34 applies;

— compressors using water or air as refrigerant;

— compressors in vehicle air conditioning systems covered by a specific product standard, e.g. ISO 13043.

This document does not deal with requirements for emission of noise.

NOTE 1 Compressors for automotive comfort air conditioning systems can be developed according e.g. SAE J 639.

NOTE 2 Noise emission depends on the complete installation of the built-in compressors and the corresponding operating conditions.



For semi-hermetic and open drive compressors which include moving parts and for which the external envelope is primarily designed for mechanical loads, thermal loads (to limit the possible deformation due to temperature), stiffness of the structure (external mechanical loads and weight of the equipment), taking into account established safe industrial practice, it is considered that pressure is not a significant design factor.

Attached parts covering other functions e.g. oil separators, oil coolers, suction accumulators comply to EN 14276-1 or EN 13445-6 (cast iron) or EN 13445-8 (aluminium) or show compliance to the relevant European requirements. This is applicable also to shells for hermetic compressors either welded or with any kind of permanent joint.

Requirements for compressors used in explosive atmospheres are not covered by this document.

NOTE 3 For further guidance see EN 1127-1.

This document deals with significant hazards, hazardous situations and events relevant to compressors, when they are used as intended and under conditions for misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This document specifies safety requirements for the design, construction, manufacture and testing, documentation and marking of compressors, including integral accessories, e.g. shut-off valve, if necessary.

This document relates to the compressor itself which is to be incorporated in a refrigerating system.

This document is not applicable to compressors as specified in the scope which are manufactured before the date of publication.

## 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 378-1:2016+A1:2020, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Basic requirements, definitions, classification and selection criteria*

EN 378-2:2016, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

EN 1779:1999,[1] *Non-destructive testing — Leak testing — Criteria for method and technique selection*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN ISO 24664:2024, *Refrigerating systems and heat pumps — Pressure relief devices and their associated piping — Methods for calculation (ISO 24664:2024)*

EN 60034-1:2010,[2] *Rotating electrical machines — Part 1: Rating and performance (IEC 60034-1:2010, modified)*

EN 60204-1:2018,[3] *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2016, modified)*



EN 60529:1991,[4] *Degrees of protection provided by enclosures (IP Code) (IEC 60529 1989, modified)*



EN IEC 60947-4-1:2019,[5] *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (IEC 60947-4-1:2018, modified)*

EN 60999-1:2000, *Connecting devices — Electrical copper conductors — Safety requirements for screw-type and screwless-type clamping units — Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm$^2$ up to 35 mm$^2$ (included) (IEC 60999-1:1999)*

EN 60999-2:2003, *Connecting devices — Electrical copper conductors — Safety requirements for screw-type and screwless-type clamping units — Part 2: Particular requirements for clamping units for conductors above 35 mm$^2$ up to 300 mm$^2$ (included) (IEC 60999-2:2003)*

EN 61010-1:2010,[6] *Safety requirements for electrical equipment for measurement, control and laboratory use — Part 1: General requirements (IEC 61010-1:2010, modified)*

---

[1] Document impacted by EN 1779:1999/A1:2003.

[2] Document impacted by EN 60034-1:2010/Corrigendum Oct. 2010.

[3] Document impacted by EN 60204-1:2018/A1:2025.

[4] Document impacted by EN 60529:1991/A1:2000, EN 60529:1991/A2:2013 and EN 60529:1991/AC:2019-02.

[5] Document impacted by EN IEC 60947-4-1:2019/AC:2020-05 and EN IEC 60947-4-1:2019/AC:2021-04.

[6] Document impacted by EN 61010-1:2010/A1:2019 and EN 61010-1:2010/A1:2019/AC:2019-04.

EN 61140:2016, *Protection against electric shock — Common aspects for installation and equipment (IEC 61140:2016)*

EN ISO 4126-1:2013,[7] *Safety devices for protection against excessive pressure — Part 1: Safety valves (ISO 4126-1:2013)*

EN ISO 4126-2:2019, *Safety devices for protection against excessive pressure — Part 2: Bursting disc safety devices (ISO 4126-2:2018)*

EN ISO 4126-3:2020, *Safety devices for protection against excessive pressure — Part 3: Safety valves and bursting disc safety devices in combination (ISO 4126-3:2020)*

EN ISO 4126-4:2013, *Safety devices for protection against excessive pressure — Part 4: Pilot-operated safety valves (ISO 4126-4:2013)*

EN ISO 9606-1:2017, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

EN ISO 9606-2:2004, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*



EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

EN ISO 15607:2019, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2019)*

EN ISO 15614-1:2017,[8] *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2017 , modified)*

EN ISO 15614-2:2025, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys (ISO 15614-2:2025)*

EN ISO 21922:2021,[9] *Refrigerating systems and heat pumps — Valves — Requirements, testing and marking (ISO 21922:2021)*

---

[7] Document impacted by EN ISO 4126-1:2013/A1:2016 and EN ISO 4126-1:2013/A2:2019.

[8] Document impacted by EN ISO 15614-1:2017/A1:2019.

[9] Document impacted by EN ISO 21922:2021/A1:2024.

ISO 20816-1:2016, *Mechanical vibration — Measurement and evaluation of machine vibration — Part 1: General guidelines*

ISO 20816-3:2022, *Mechanical vibration — Measurement and evaluation of machine vibration — Part 3: Industrial machinery with a power rating above 15 kW and operating speeds between 120 r/min and 30 000 r/min*

ISO 20816-8:2018, *Mechanical vibration — Measurement and evaluation of machine vibration — Part 8: Reciprocating compressor systems*

# 3 Terms, definitions and symbols

## 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 378-1:2016+A1:2020, EN ISO 12100:2010 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

NOTE All pressures are gauge pressures unless otherwise specified.



**3.1.1**
**positive displacement compressor**
compressor in which compression is obtained by changing the internal volume of the compression chamber



**3.1.2**
**maximum allowable pressure**
***PS***
maximum allowable pressure as stated by the compressor manufacturer, chosen by the manufacturer for each pressure stage of the compressor

Note 1 to entry: The common situation is that different values for PS are chosen for each pressure stage of the compressor.

Note 2 to entry: There are in minimum two pressure stages on each compressor: the low pressure side (LP) and the high pressure side (HP), but additional intermediate pressure stage(s) can be present.

Note 3 to entry: The individual pressure stage of a compressor is connected to the corresponding “part of the refrigerating system”, as defined in EN 378-1:2016+A1:2020, 3.1.8.

**3.1.3**
**compressor overflow device**
pressure relief device specifically intended to protect only the compressor against bursting caused by abnormal conditions, e.g. the discharge valve shut

Note 1 to entry: The compressor overflow device relieves from the high pressure/intermediate side of the compressor to a lower pressure side.

Note 2 to entry: The compressor overflow device may be a bursting disc or may be a spring loaded overflow valve. Spring loaded overflow valves can be either back pressure compensating or back pressure dependent type.

**3.1.4**
**corrosion**
all forms of material waste (e. g. oxidation, erosion, wear and abrasion)

**3.1.5**
**maximum operating temperature**
highest temperature that can occur during operation or standstill of the refrigerating system or during testing under test conditions

**3.1.6**
**minimum operating temperature**
lowest temperature that can occur during operation or standstill of the refrigerating system or during testing under test conditions

**3.1.7**
**pressure bearing part**
part, which is subject to stress due to internal pressure greater than 50 kPa (0,5 bar) gauge

**3.1.8**
**main pressure bearing part**
part, which constitute the envelope under pressure, essential for the integrity of the equipment

Note 1 to entry: Examples are housings, ends and flanges.

[SOURCE: EN 13445-1:2021, 3.6, modified - The term has been changed to the singular.]



**3.1.9**
**maximum allowable pressure at ambient temperature of –10 °C to +50 °C**
***PS*$_0$**

maximum pressure for which the refrigerant compressor is designed, as specified by the manufacturer, at ambient temperature of –10 °C to +50 °C

**3.1.10**
**intended use**
use of a machine in accordance with the information for use provided in the instructions

[SOURCE: EN ISO 12100:2010, 3.23]

## 3.2 Symbols

For the purposes of this document, the symbols of Table 1 apply.

**Table 1 — Symbols**

| | | |
|---|---|---|
| $A_L$ | Elongation after fracture where the measured length is equal or greater than 0,4 times of diameter of the rod | mm |
| $A_5$ | Elongation after fracture where the measured length is equal to 5 times of diameter of the rod | % |
| $a$ | Lifetime in years for calculating effect of corrosion; typically 20 years | — |
| $C_Q$ | Factor to compensate for the quality of a casting | — |
| $\delta_e$ | Negative wall thickness tolerance | mm |

| | | |
|---|---|---|
| $e_{act}$ | Actual wall thickness at given measuring points of the refrigerant compressor to be tested | mm |
| $e_B$ | Reference thickness is the minimum material thickness needed to give adequate strength to pressure bearing parts | mm |
| $e_c$ | Reduction in wall thickness caused by occurrence of corrosion | mm |
| $e_{con}$ | Wall thickness as specified in the design drawing | mm |
| $KV$ | Impact rupture energy | J |
| $KV_0$ | Threshold value of impact rupture energy, where the impact rupture energy is defined as independent of the temperature | J |
| $KV_0^{\mathbf{t}}$ | Standard value of impact rupture energy at standard temperature of the material | J |
| $KV_{TS\ min}$ | Impact rupture energy at minimum operating temperature $TS_{min}$ | J |
| $P_F$ | Maximum allowable design test pressure | bar |
| $PS$ | Maximum allowable pressure | bar |
| $PS_0$ | Maximum allowable pressure at ambient temperature (−10 °C to + 50 °C) | bar |
| $PS_{TS\ max}$ | Maximum allowable pressure at maximum operating temperature | bar |
| $PS_{TS\ min}$ | Maximum allowable pressure at minimum operating temperature | bar |
| $P_{Test}$ | Minimum burst test pressure (greater than $P_F$) | bar |
| $R_{p\ 0,2}$ | Proof strength, 0,2 % offset at ambient temperature | MPa, $N/mm^2$ |
| $R_{p\ 0,2\ TS\ min}$ | Proof strength, 0,2 % offset at minimum operating temperature | MPa, $N/mm^2$ |
| $R_{p\ 0,2/t}$ | Proof strength, 0,2 % offset at temperature t | MPa, $N/mm^2$ |
| $R_{p\ 0,2\ TS\ max}$ | Proof strength, 0,2 % offset at maximum operating temperature | MPa, $N/mm^2$ |
| $R_{p\ 1,0}$ | Proof strength, 1,0 % offset at ambient temperature | MPa, $N/mm^2$ |
| $R_{eH}$ | Upper yield strength | MPa, $N/mm^2$ |
| $R_{eH\ TS\ max}$ | Upper yield strength at maximum operating temperature | MPa, $N/mm^2$ |
| $R_m$ | Tensile strength | MPa, $N/mm^2$ |
| $R_{m\ TS\ max}$ | Tensile strength at maximum operating temperature | MPa, $N/mm^2$ |
| $R_{m\ act}$ | Actual tensile strength of the material of the refrigerant compressor to be tested | MPa, $N/mm^2$ |

| | | |
|---|---|---|
| $R_{\text{m con}}$ | Tensile strength used for the design | MPa, $N/mm^2$ |
| $S_C$ | Factor to compensate effects of corrosion | — |
| $S_{\text{fast}}$ | relation between maximum allowable strength at operating temperature and the maximum allowable strength at ambient temperature | — |
| $S_{\text{TS min}}$ | Factor taking into consideration the impact rupture energy reduction due to minimum operating temperature | — |
| $S_{\text{TS max}}$ | Factor to allow for the reduction in strength due to the maximum operating temperature | — |
| $S_\sigma$ | Factor to allow for the test pressure | — |
| $\sigma_{\text{con}}$ | Initial design stress | MPa, $N/mm^2$ |
| $\sigma_{\text{corr}}$ | Allowable stress values derived from $\sigma_{\text{con}}$ | MPa, $N/mm^2$ |
| $t_{\text{min 25}}$ | Lowest temperature at which pressure bearing parts can be used, if their load amounts to 25 % of the allowable design stress at 20 °C, taking the safety factors according to Table A.1 into account | °C |
| $t_{\text{min 75}}$ | Lowest temperature at which pressure bearing parts can be used, if their load amounts to 75 % of the allowable design stress at 20 °C, taking the safety factors according to Table A.1 into account | °C |
| $t_{\text{min 100}}$ | Lowest temperature at which pressure bearing parts can be used, if their load amounts to 100 % of the allowable design stress at 20 °C, taking the safety factors according to Table A.1 into account | °C |
| $T_R$ | Design reference temperature is the minimum operating temperature $TS_{\text{min}}$ adjusted. Used when determining $TS_{\text{min}}$ based on reference thickness $e_B$ | |
| $T_S$ | Temperature adjustment of the design reference temperature $T_R$ | |
| $T_{KV}$ | Impact test temperature | |
| $TS$ | Operating temperature | °C |
| $TS_{\text{min}}$ | Lowest operating temperature | °C |
| $TS_{\text{max}}$ | Maximum operating temperature | °C |
| $X$ | Correction of the actual wall thickness relative to the wall thickness of the design | — |
| $Y$ | Correction on the basis of current strength values of the test sample relative to the strength parameters for the design of refrigerant compressor | — |
| $Z$ | Factor to allow for the quality of a joint (e.g. welded joint) | — |
| $\partial$ | Wall thickness reduction per year | mm |
| NOTE 1 bar = 0,1 MPa. | | |