



SLOVENSKI STANDARD

oSIST prEN 12015:2018

01-november-2018

Elektromagnetna združljivost - Standard družine izdelkov za dvigala (lifte), tekoče stopnice in tekoče steze - Oddajanje motenj

Electromagnetic compatibility - Product family standard for lifts, escalators and moving walks - Emission

Elektromagnetische Verträglichkeit-Produktfamilien-Norm für Aufzüge, Fahrtreppen und Fahrsteige - Störaussendung

Compatibilité électromagnétique - Norme famille de produits pour ascenseurs, escaliers mécaniques et trottoirs roulants - Émission

Ta slovenski standard je istoveten z: prEN 12015

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English Version

Electromagnetic compatibility - Product family standard for lifts, escalators and moving walks - Emission

Compatibilité électromagnétique - Norme famille de produits pour ascenseurs, escaliers mécaniques et trottoirs roulants - Émission

Elektromagnetische Verträglichkeit-Produktfamilien-Norm für Aufzüge, Fahrtreppen und Fahrsteige - Störaussendung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 10.

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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

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European foreword

This document (prEN 12015:2018) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12015:2014.

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.

The limits given in this European Standard recognize the fact that the product family covers a total range of lifts, escalators and moving walks used in residential buildings, offices, hospitals, hotels, industrial plants, etc. and that lifts, escalators and moving walks are deemed to have their own dedicated power supply and be connected with the consent of the supply authority to a low impedance source.

The related EMC product family standard for immunity is:

EN 12016, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Immunity*.

SIST EN 12015:2020

<https://standards.iteh.ai/catalog/standards/sist/b662e940-574d-4db4-9323-9f53d87eae2f/sist-en-12015-2020>

Introduction

This European Standard is a Type C standard as stated in EN ISO 12100.

This European Standard has been prepared to provide one means of complying with the requirements of the Electromagnetic Compatibility (EMC) Directive. The requirements of this European Standard have been specified so as to ensure a level of electromagnetic emission which will cause minimal disturbance to other equipment. The levels, however, do not cover the following cases:

- a) where the probability of an occurrence likely to produce emissions in excess of those which would normally be experienced is extremely low, e.g. the emergency stopping of a lift, escalator or moving walk under a fault condition;
- b) where highly susceptible apparatus will be used in the close proximity of the equipment covered by this European Standard, in which case further measures may have to be taken to:
 - 1) reduce the level of electromagnetic emission to below that specified in this European Standard; or
 - 2) increase the immunity of the affected apparatus.

The given emission limits, are on the basis that equipment of the product family range may be installed both indoor and outdoor in all types of building, involves the switching of heavy currents and high inductive loads and, generally, is connected to a low voltage system.

Values for the harmonic emission limits are taken from the harmonized standard EN 61000-3-12:2005. Taking into account the characteristics and environment of lifts, escalators and moving walks these harmonic values are applicable for all input currents without current limitation stated by EN 61000-3-12:2005.

Due to the size of an installed lift, it becomes impracticable to test the total assembly either in a test laboratory or in situ where the uncontrolled environment may also influence the test procedures and results. This applies also to measurements within the car. Similar considerations regarding dimensions apply equally to the testing of escalators and moving walks.

Rational to the revision of EN 12015:1998

a) Important changes

Introduced requirements to control the emissions below 30 MHz of the drive to machine/motor connection. The emission limits are independent of the magnitude of the conducted current. Limits and test method are referred to EN 55014-1:2000. Regarding other ports, the radiated tests above 30 MHz cover the cable connections and there are no known problems below 30 MHz.

Introduced requirements to control mains electricity supply harmonic emissions and voltage fluctuations.

NOTE The radiation measurements in Table 1 have been harmonised with EN 55011:1998.

The term "installation" has been changed to "system". This is due to the fact that official interpretation defines that fixed installations are not covered by the conformity assessment procedures for CE Marking and declaration of conformity according to the EMC Directive, valid for apparatus and systems. The scope of the standard is applicable to the apparatus and assembly of apparatus of lifts and escalators and assembly into systems.

b) Environmental issues

Lifts, escalators and moving walks are systems whose apparatus and assembly of apparatus are distributed (and some of which move) throughout the building. The definition in EMC terms of the use of the building (residential or industrial) cannot be predetermined or assumed to be fixed. Therefore, to cover requirements in all cases, no differentiation between environments has been made and a single set of limits has been maintained. This set of high frequency limits is based on the industrial limits of EN 61000-6-4:1997 and is known to be above the usual limits for the residential environment. This is justified by the experience that systems in compliance with EN 12015:1998 have not been known to cause EMC interference with regard to mains and radiated emissions above 30 MHz.

Regarding conducted limits, these are also based on the fact that the supply cabling is separated from other building supplies at least up to the point of common coupling (PCC). Additionally, system wiring is segregated in accordance with the manufacturers' specifications.

Regarding radiated emission limits above 30 MHz, the lift, escalator or moving walk area is separated, to a large extent, from domestic appliances.

All the limits used take into account that systems have to comply with the safety protection requirements regarding earth leakage currents. The application of more stringent limits than have been shown to be adequate, would require the use of larger filters (both inductance and capacitance). The use of these will increase the susceptibility of the system to low electricity mains supply conditions and increase earth leakage currents. There is also an increase in power dissipation in the filter, causing (in the general case) increased energy consumption, additional ventilation and/or cooling requirement for the building. This is especially valid for higher duty systems.

Rational to the revision of EN 12015:2004

In general, lifts, escalators and moving walks are connected to three-phase supply and considered as a combination of a balanced three-phase load and one or more loads connected between phase and neutral or between phases, defined as hybrid equipment in EN 61000-3-12:2005, 3.7. Therefore EN 61000-3-12:2005, Tables 2, 3 and 4 apply to the system in accordance with flow chart of application of harmonic limits. In most of the cases, Table 3 and Table 4 apply by prior verification of 3rd order harmonic.

Regarding lifts, escalators and moving walks connected to single-phase supply, EN 61000-3-12:2005, Table 2 is applicable to the A.C. mains port.

As the supply authorities do not guarantee a defined mains impedance, the mains short circuit power may vary from location to location. As these parameters are normally not known in advance, a practical assumption has to be made, based on values already known from other lifts/escalators and moving walks already in service. Due to that fact, a short circuit ratio $R_{scc} = 250$ is defined as an average value for lifts, escalators and moving walks.

Radio equipment and telecommunications terminal equipment clearly falls under the 1999/5/EC Directive (R&TTE) even if it is used as part of lifts, escalators and moving walks.

Rational to the revision of EN 12015:2014

Relationship between this European Standard and the essential requirements of Directive 2014/30/EU.

1 Scope

This document specifies the emission limits in relation to electromagnetic disturbances and test conditions for lifts, escalators and moving walks, which are intended to be permanently installed in buildings. These limits however, may not provide full protection against disturbances caused to radio and TV reception when such equipment is used within distances given in Table 1.

This document is not applicable for apparatus which are manufactured before the date of its publication as EN.

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 55011:2009, *Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement (CISPR 11:2009, modified)*

EN 55014-1:2006, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission (CISPR 14-1:2005)*

EN 55022:2010, *Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22:2008, modified)*

EN 61000-3-2:2006, *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (IEC 61000-3-2:2005)*

EN 61000-3-11:2000, *Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection (IEC 61000-3-11:2000)*

EN 61000-3-12:2005, *Electromagnetic compatibility (EMC) - Part 3-12: Limits - % Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase (IEC 61000-3-12:2004)*

EN 61000-6-3:2007, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006)*

EN 61000-6-4:2007, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006)*

IEC 60050-161:1990+A1:1997+A2:1998, *International Electrotechnical Vocabulary - Chapter 161: Electromagnetic compatibility*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 61000-6-3:2007, EN 61000-6-4:2007 and IEC 60050-161:1990+A1:1997+A2:1998 and the following apply.

3.1

apparatus

assembly of components with an intrinsic function as defined by its manufacturer

Note 1 to entry: See Figure 1 and Figure 2 as examples.

Note 2 to entry: Safety components defined by Annex IV of the Lifts Directive (Directive 95/16/EC) are considered as apparatus.

3.2

assembly of apparatus

arrangement of interconnected apparatus, which can be tested together

Note 1 to entry: See Figure 1 and Figure 2 as examples.

3.3

balanced three-phase equipment

three-phase equipment which is connected to the three line conductors of a three-phase supply and in which the three line or phase currents are designed to be identical in amplitude and wave-shape, each being displaced from the other two by one-third of a fundamental period

3.4

enclosure port

physical boundary of the apparatus/assembly of apparatus through which electromagnetic fields can radiate or impinge

Note 1 to entry: See Figure 3 as an example.

3.5

hybrid equipment

combination of a balanced three-phase load and one or more loads connected between phase and neutral or between phases

3.6

partial weighted harmonic distortion

PWHD

ratio of the r.m.s. value of a selected group of higher order harmonics (here beginning from the 14th harmonic), weighted with the harmonic order n , to the r.m.s. value of the fundamental

Note 1 to entry: PWHD is calculated from the formula below. I_n means the r.m.s. value of the current of the n^{th} harmonic and I_1 means the r.m.s. value of the fundamental current:

$$PWHD = \sqrt{\sum_{n=14}^{40} n \left(\frac{I_n}{I_1} \right)^2}$$

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3.7

point of common coupling**PCC**

point in the public mains network which is nearest to the system and to which, other equipment may be connected

3.8

port

particular interface of the specified apparatus/assembly of apparatus with the external electromagnetic environment

Note 1 to entry: See Figure 3 as an example.

3.9

reference fundamental current I_1

r.m.s. value of the fundamental component of the rated line current I_{equ} of the system (equipment)

3.10

root mean square**r.m.s.**

effective value of the current

3.11

short circuit ratio R_{Sce}

ratio of the short circuit power of the source to the apparent power of the load(s) as defined by EN 61000-3-12:2005, 3.10

3.12

system

equipment

lift, escalator or moving walk comprising assembly of apparatus with electrical and electronic equipment and interconnections

Note 1 to entry: See Figure 1 and Figure 2 as examples.

Note 2 to entry: Term "system" is intended as "equipment" in relation to application of EN 61000-3-12:2005.

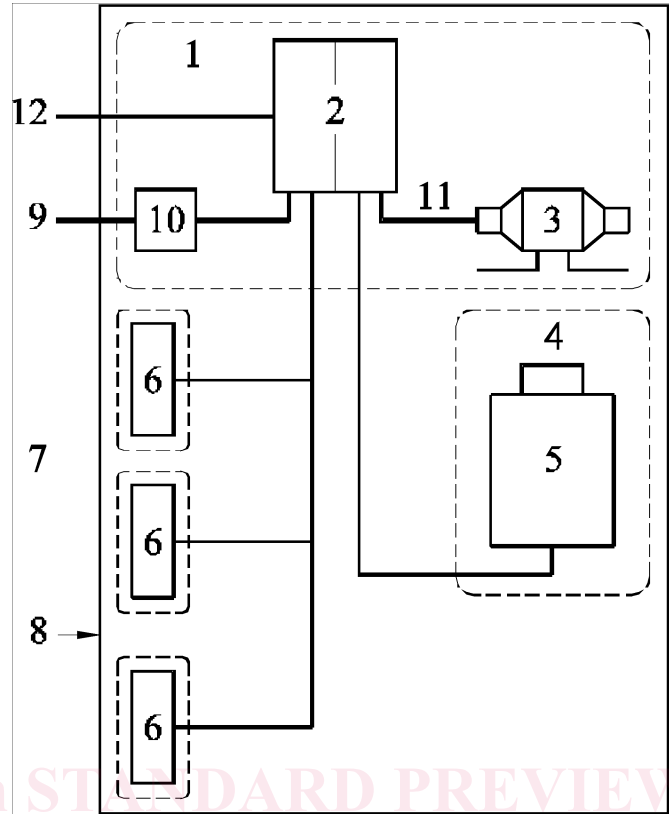
3.13

total harmonic distortion**THD**

ratio of the r.m.s. value of the harmonics to the r.m.s. value of the fundamental

Note 1 to entry: *THD* is calculated from the formula below. I_n means the r.m.s. value of the current of the n^{th} harmonic and I_1 means the r.m.s. value of the fundamental current:

$$THD = \sqrt{\sum_{n=2}^{40} \left(\frac{I_n}{I_1} \right)^2}$$



Key assembly of apparatus

- | | | | |
|---|---|----|---|
| 1 | machinery space | 7 | landings |
| 2 | main control/control cabinet | 8 | system boundary |
| 3 | machine | 9 | AC - and/or DC power ports |
| 4 | door control | 10 | main switch |
| 5 | lift car | 11 | output power port |
| 6 | apparatus installed at the landing (e.g. pushbuttons, indicators) | 12 | ports for monitoring and remote alarm systems |

Figure 1 — EMC model example (emission) for lift systems