

# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 8102-2

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## Electrical requirements for lifts, escalators and moving walks —

### Part 2:

## Electromagnetic compatibility with regard to immunity

*Exigences électriques pour ascenseurs, escaliers mécaniques et trottoirs roulants —*

*Partie 2: Compatibilité électromagnétique en ce qui concerne l'immunité*

ICS: 91.140.90

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## Foreword

(ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization. International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2. The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote. Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. ISO 8102-2:2017 supersedes ISO 22200:2009. ISO 8102-2 was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*. This third edition cancels and replaces the second edition (ISO 22200:2009), which has been technically revised.

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## Introduction

ISO 8102-2 is a type-C standard as stated in ISO 12100-1. When provisions of a type-C standard are different from those which are stated in type-A or type-B standards, the provisions of the 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 the type-C standard. This International Standard (3<sup>rd</sup> edition) is based upon the European Standard EN 12016:2013. The requirements of this International Standard have been specified so as to ensure a level of electromagnetic immunity which will allow minimal disturbance to the product family. Two levels of immunity are given which have been selected such that the immunity levels for safety circuit apparatus are higher than the immunity levels for general function apparatus. The higher levels cover the possibility for example of disturbances emanating from hand-held transmitters in close proximity to safety circuit apparatus. Neither level, however, covers cases where an extremely low probability of occurrence exists.

Test levels and immunity performance criteria are defined for:

- apparatus which are safety components or are used in conjunction with safety components, (safety circuits);
- apparatus used in general function circuits.

The immunity levels given are on the basis that equipment of the product family range is installed both indoor and outdoor in all types of building and, generally, is connected to a low voltage system. 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.

The following explains the rationale to the revisions of this International Standard.

- New performance criterion C has been specified for voltage dip and voltage interruption.
- Because of extension of operating frequencies in the digital mobile telephone services and wireless communication systems, new requirements have been added on radio frequency electromagnetic field to cover up to 2 655 MHz.
- For the evaluation of test results regarding the Radio equipment as defined by National Regulation used in apparatus/assembly of apparatus, the exclusion band defined by the standards applies for that specific radio equipment.
- In addition, the uncontrolled operation of radio transmitter used in combined apparatus/assembly of apparatus is not allowed.

ISO 8102-2:2017 supersedes ISO 22200:2009.

### **The Introduction for ISO 22200:2009 edition was as follows:**

ISO 22200:2009 is based upon and contains no technical deviations from EN 12016:2004, except that the most recent specified radio frequency limits have been taken into account.

It is known that in the field of electromagnetic compatibility (EMC) provision, technology changes often require amendments to standards. It can be expected that radio frequency (RF) field ranges above 500 MHz for communications technology will continue to be introduced into the market. This International Standard has been prepared with the assumption that equipment utilizing frequencies above 500 MHz is not used in close proximity (200 mm) to lift, escalator and moving walk controls.

New technology equipment operating in high radio frequency (RF) field ranges will steadily be introduced into the market.

#### **a) Important changes**

- As a result of harmonization with the latest EN standard, the following new requirements have been established with this International Standard.
- Change of the term “installation” to “system”. The scope of the standard is applicable to the apparatus and assembly of apparatus of lifts and escalators and assembly into systems.
- New requirements for radio frequency electromagnetic field above 500 MHz, which have been extended to cover digital mobile telephone services up to 2 170 MHz.
- New requirements for surge testing on safety circuits.
- New requirements for radio frequency electromagnetic fields regarding safety circuits.
- New requirement to address the possible effects of mobile telephones or radio transmitters.
- Advanced requirements for several environmental phenomena considering the progress in EMC technology and the results of the EN 12016:2004 risk assessment.
- New requirements for immunity to mains power supply voltage interruptions and voltage dips.

b) Environmental issues

- 1) Lifts, escalators and moving walks are systems whose component apparatus/assembly of apparatus are distributed (and some of which move) throughout the building. The definition, in terms of the EMC, 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 was made and a single set of limits has been maintained.
- 2) Severe electromagnetic environments have not been considered. Examples of these are: radio transmitter stations, railways and metros, heavy industrial plants and electricity power stations. Additional tests and immunity measurements may need to be taken on apparatus to be used in these environments.
- 3) The levels of immunity and the resultant performance criteria, which are given in this International Standard, reflect the fact that lifts, escalators and moving walks are deemed to consist of selfcontained subsystems and apparatus (e.g. machine room and lift car). The related EMC product family standard for emission is ISO 8102-1.

# Electrical requirements for lifts, escalators and moving walks —

## Part 2: Electromagnetic compatibility with regard to immunity

### 1 Scope

This International Standard specifies the immunity performance criteria and test levels for apparatus used in lifts, escalators and moving walks which are intended to be permanently installed in buildings including the basic safety requirements in regard to their electromagnetic environment. These levels represent essential EMC requirements.

The standard refers to EM conditions as existing in residential, office and industrial buildings.

This standard addresses commonly known EMC related hazards and hazardous situations relevant to lifts, escalators and moving walks when they are used as intended and under the conditions foreseen by the lift installer or escalator and/or moving walk manufacturer.

It is assumed that no ports connected to safety circuit only are rated at currents greater than 100 amps.

It is assumed that mobile telephones and radio transmitters used at frequencies and power of that stated in

Table 1 are not placed within 200 mm distance from safety circuit(s).

However:

- performance criteria and test levels for apparatus/assembly of apparatus used in general function circuits do not cover situations with an extremely low probability of occurrence;
- this standard does not apply to other apparatus already proven to be in conformity to the EMC National Regulation, and not related to the safety of the lift, escalator or moving walk, such as lighting apparatus, communication apparatus, etc.

This standard does not apply to electromagnetic environments such as:

- radio transmitter stations;
- railways and metros;
- heavy industrial plant;
- electricity power stations

which need additional investigations.

This standard is not applicable to apparatus which were manufactured before the date of its publication.

## 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.

- 1) This document is currently impacted by IEC 60050-161:1990/A1:1997 and IEC 60050-161:1990/A2:1998.
- 2) This document is currently impacted by IEC 61000-4-3:2006/A2:2010.

CISPR 22:2008, *modified, Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement*

CISPR 24:2010, *Information technology equipment - Immunity characteristics - Limits and methods of measurement*

IEC 60050-161:1990, *International Electrotechnical Vocabulary — Chapter 161: Electromagnetic compatibility 1)*

IEC 61000-4-2:2008, *Electromagnetic Compatibility (EMC) — Part 4-2: Testing and measurement techniques; Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) — Part 4-3: Testing and measurement techniques; Radiated, radio-frequency, electromagnetic field immunity test 2)*

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) — Part 4-4: Testing and measurement techniques — Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) — Part 4-5: Testing and measurement techniques — Surge immunity test*

IEC 61000-4-6:2008, *Electromagnetic Compatibility (EMC) — Part 4-6: Testing and measurement techniques — Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-11:2004, *Electromagnetic Compatibility (EMC) — Part 4-11: Testing and measurement techniques — Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-6-1:2005, *Electromagnetic compatibility — Part 6-1: Generic standards — Immunity for residential, commercial and light-industrial environments*

IEC 61000-6-2:2005, *Electromagnetic Compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments*

## 3 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 61000-6-1, IEC 61000-6-2, IEC 60050-161 and the following apply

### 3.1

#### **assembly of apparatus**

arrangement of interconnected apparatus, which can be tested together

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

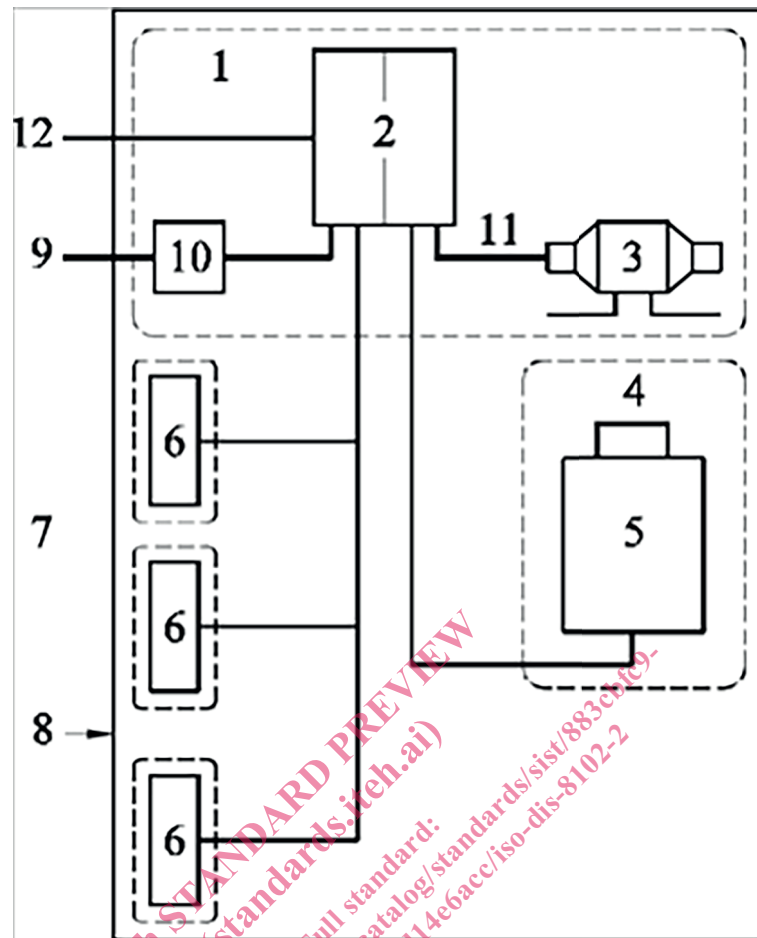
### 3.2

#### **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.

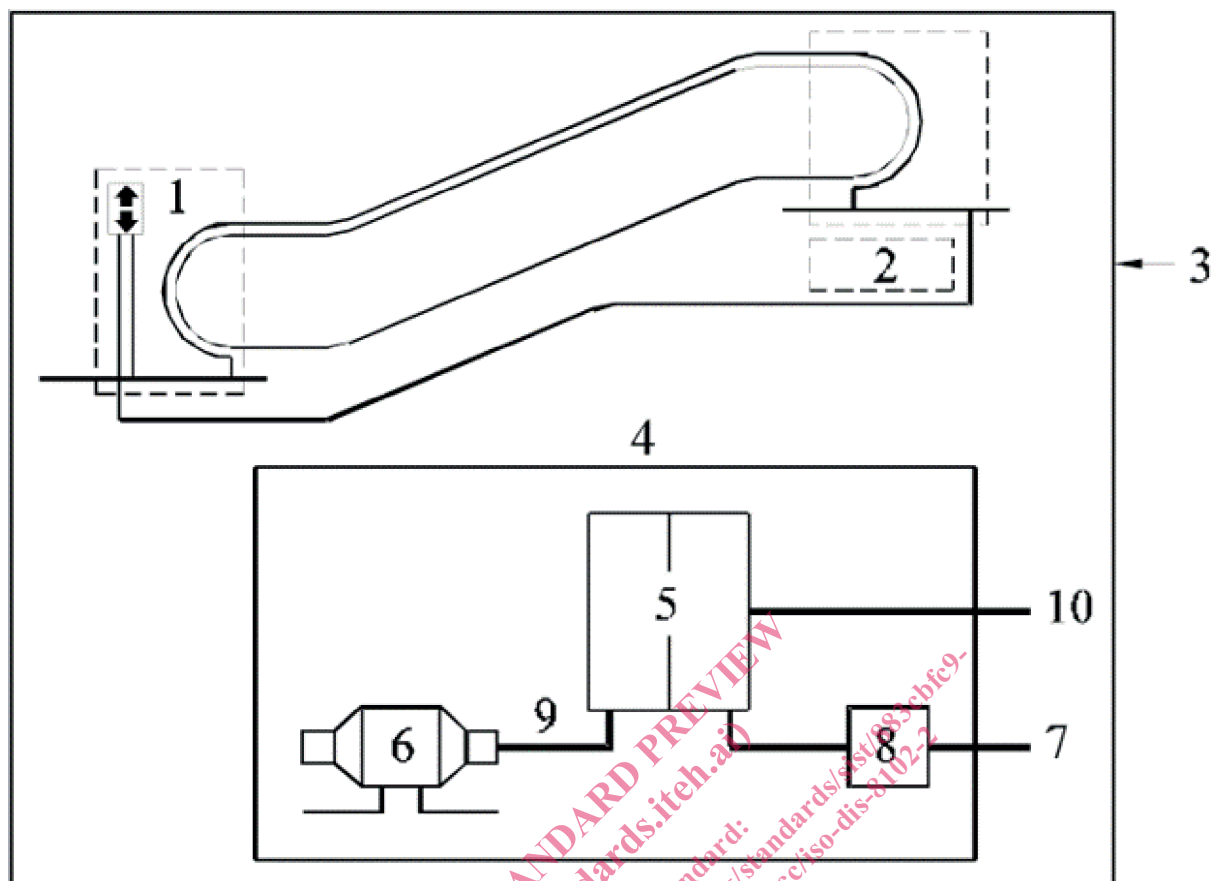


**Key**

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. push buttons, indicators) | 12 | ports for monitoring and remote alarm systems |

**Figure 1 — EMC example (immunity) for lift systems**



**Key**



assembly of apparatus

- |   |                               |    |                            |
|---|-------------------------------|----|----------------------------|
| 1 | control panels                | 6  | machine                    |
| 2 | machinery space (see 4 to 10) | 7  | AC – and/or DC power ports |
| 3 | system boundary               | 8  | main switch                |
| 4 | machinery space               | 9  | output power port          |
| 5 | main control/control cabinet  | 10 | ports for monitoring       |

NOTE the machinery space can also be an external room.

**Figure 2 — EMC example (immunity) for escalator and moving walk systems**

### 3.3

#### enclosure port

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

Note 1 to entry: See Figure 3 as example.

### 3.4

#### general function circuit

circuitry used in apparatus which does not incorporate safety circuits (see Figure 1 to Figure to 3)