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

*Compatibilité électromagnétique — Norme pour la famille de produits:
ascenseurs, escaliers mécaniques et trottoirs roulants — Émission*

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 22199 was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*.

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Introduction

This International Standard is based upon the European Standard EN 12015:1998. This International Standard contains no technical deviations from EN 12015:1998.

In the meantime, EN 12016:2004, which supersedes EN 12016:1998, has been published with new requirements to control the emissions below 30 MHz of the drive to machine/motor connection and mains electricity supply harmonic emissions and voltage fluctuations. As of the publication date of this International Standard, an ISO/TC 178 resolution has been opened to address these new requirements in the next revision of ISO 22199.

The limits given in this International 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 passenger conveyors are deemed to have their own dedicated power supply and be connected with the consent of the supply authority to a low impedance source. This International Standard is the product family standard for the electromagnetic compatibility of lifts, escalators and moving walks (emission) and takes precedence over all aspects of the generic standard.

The ISO/TC 178/WG8 committee, responsible for this International Standard, is aware that the normatively referenced documents CISPR 11 and CISPR 14-1 have been revised since the development of this document. In order to keep this International Standard active, WG8 is preparing, as of the date of publication of this International Standard, a simple amendment (editorial) that allows for a current version of the CISPR documents to be referenced without any modification to the technical requirements of this International Standard as published. The amendment will be available in the near future.

The related EMC product family standard for immunity is ISO 22200.

The requirements of this International Standard have been specified so as to ensure a level of electromagnetic emission that causes 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 are normally experienced is extremely low, e.g. the emergency stopping of a lift, escalator or passenger conveyor under a fault condition;
- b) where highly susceptible apparatus is used in the close proximity of the equipment covered by this International Standard, in which case further measures might have to be taken to:
 - reduce the electromagnetic emission to below the levels specified in this International Standard;or
 - increase the immunity of the affected apparatus.

The emission limits given are on the basis that equipment of the product family range is 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.

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

1 Scope

This International Standard specifies the emission limits and test conditions for lifts, escalators and passenger conveyors that are permanently installed in buildings and for which ISO/TC 178 has direct responsibility for the production of International Standards, in relation to electromagnetic interference. These limits, however, might not provide full protection against disturbances caused to radio and TV reception when such equipment is used within distances given in Table 1.

Since lifts travel large vertical distances in buildings, it becomes impracticable to test the installation either in a test laboratory or *in situ* (where the uncontrolled environment can also influence the test procedures and results). Likewise, due to practical restrictions imposed by the lift car internal dimensions, it is impracticable to test the lift car from within. Similar considerations regarding dimensions apply equally to the testing of escalators and passenger conveyors. Therefore, this International Standard applies to the subsystems and/or apparatus of lifts, escalators and passenger conveyors, an assembly of which will comprise an installation, the boundaries of which are indicated by example in Figures 2 and 3. However, this International Standard does not apply to lighting apparatus and also other services already proven to be in conformity with national EMC regulations

Equipment covered by this International Standard can also fall within the scope of IEC 61000-3-2, IEC 61000-3-3, IEC 61000-3-4 and IEC 61000-3-5 as appropriate.

2 Normative references

The following referenced documents are indispensable for the application 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.

CISPR 11:2004, *Industrial, scientific and medical (ISM) radio-frequency equipment — Electromagnetic disturbance characteristics — Limits and methods of measurement*.

CISPR 14-1:2002 *Electromagnetic compatibility — Requirements for household appliances, electric tools and similar apparatus — Emission*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

installation

lift, escalator or passenger conveyor installation comprising subsystems with electrical and electronic equipment and interconnections

**3.2
subsystem**

assembly of apparatus which is appropriate for assessment for conformity to this standard and, by means of interconnection with other subsystems, forms an installation (see Clause 4)

**3.3
apparatus**

assembly of components with an intrinsic function intended for use in a subsystem or installation

**3.4
port**

particular interface of the specified subsystem or apparatus with the external electromagnetic environment (see Figure 1)

**3.5
enclosure port**

the boundary of the subsystem or apparatus through which electromagnetic fields can radiate or impinge

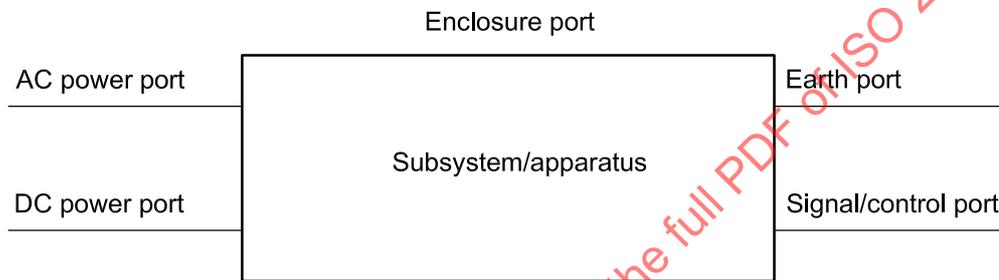


Figure 1 — Example of ports

4 Composition of subsystems

The following assemblies of apparatus shall be considered as subsystems and are exemplified in Figures 2 and 3:

a) for lifts:

- 1) all machine room apparatus connected to the lift main switch ,
- 2) apparatus associated with the lift car, e.g. door gear, control panel, door protection devices, etc.,
- 3) apparatus associated with each lift floor excluding the lift car;

b) for escalators and passenger conveyors:

- 1) all machine room apparatus connected to the escalator or passenger conveyor main switch ;
- 2) apparatus associated with escalator or passenger conveyor landings.

Other assemblies of apparatus can also be considered as subsystems.

5 Test set-up

- 5.1** The tests, test methods, characteristics of the tests and test set-ups shall be as stated in CISPR 11.
- 5.2** The measurements shall be made in the operation mode producing the largest emission in the frequency band being investigated (see Tables 1 and 2) consistent with normal applications. An attempt shall be made to maximize the emission by varying the configuration of the test sample.
- 5.3** Travelling cables or any other cables likely to be more than 5 m long shall be represented by a sample at least 5 m long connected to the relevant port for the purpose of testing for radiative emission.
- 5.4** If the apparatus has a large number of similar ports or ports with many similar connections, then a sufficient number shall be selected to simulate actual operating conditions and to ensure that all the different types of termination are covered.
- 5.5** It is not always possible to measure emission for every function of the apparatus or subsystem. In such cases, the most critical period of operation shall be selected under normal operating modes.
- 5.6** The tests shall be carried out at a single set of environmental conditions within the manufacturers specified operating range of temperature, humidity, pressure and supply voltage, unless otherwise indicated in CISPR 11.
- 5.7** Measurements shall be taken in well-defined and reproducible conditions for each test.
- 5.8** Measurement shall be taken at the enclosure (radiative) ports and a.c. mains (conductive) ports of the apparatus or subsystem.
- 5.9** The configuration and mode of operation during measurement shall be precisely noted in the test report if one is produced.

NOTE The purpose of the test report is to support the manufacturers declaration of conformity.

6 Applicability of tests

NOTE The application of tests for evaluation of levels of emission depends on the type of apparatus or subsystem, its configuration, ports, technology and operating conditions.

- 6.1** It might be determined from consideration of the electrical characteristics and usage of a particular apparatus or subsystem that some of the tests are inappropriate and therefore unnecessary. In such a case, the decision and justification not to test shall be recorded in the test report if one is produced.

NOTE The purpose of the test report is to support the manufacturers declaration of conformity.

- 6.2** Where deviations from the test methods specified in 5.1 are applied, such deviations shall be justified and recorded in the test report if one is produced.

NOTE The purpose of the test report is to support the manufacturers declaration of conformity.

7 Emission limits

7.1 Enclosure (radiative) ports

The electromagnetic emission levels measured at each enclosure (radiative) port of the subsystem or apparatus shall not exceed the limits specified in Table 1. These limits are not applicable to *in-situ* measurements.

7.2 A.c. mains (conductive) ports

The electromagnetic emission levels measured at each ac mains (conductive) port of the subsystem or apparatus operating at less than 1 000 V r.m.s. shall not exceed the limits specified in Table 2. Different limits apply to emissions resulting from certain rates of impulse noise, as stated in 7.3.

7.3 Impulse noise

Electromagnetic emission levels resulting from impulse noise (clicks), measured as for 7.2, shall not exceed the limits specified in Table 2 if the clicks occur more frequently than 30 times per minute. Electromagnetic emission levels, resulting from clicks which occur between 5 and 30 times per minute, shall not exceed the limits specified in Table 2 raised by a value of $20 \times \log 30/N$ dB(μ V μ V) (where N is the number of clicks per minute). Electromagnetic emission levels resulting from isolated clicks shall not exceed the limits specified in CISPR 14-1:2002. There are no limits for clicks which occur less than 5 times per minute.

7.4 Measurement

To determine conformity to the requirements of 7.1, 7.2 and 7.3, emission levels shall be measured by the methods specified in CISPR 11 and under the conditions specified in Clause 5.

8 Documentation for the user of the subsystem or apparatus

The user shall be provided with documentary information on any measures which have to be observed to achieve compliance with this International Standard.

Table 1 — Emission limits for enclosure (radiative) ports

Frequency range MHz	Limits	
	dB(μ V/m)	
	Measurement at 30 m distance	Measurement at 3 m to 10 m ^a distance
$30 \leq F < 230$	30 quasi peak	40 quasi peak
$230 \leq F \leq 1\ 000$	37 quasi peak	47 quasi peak

^a The measurements shall not be taken at a distance of less than 3 m.

Table 2 — Emission limits for a.c. mains (conductive) ports ^a

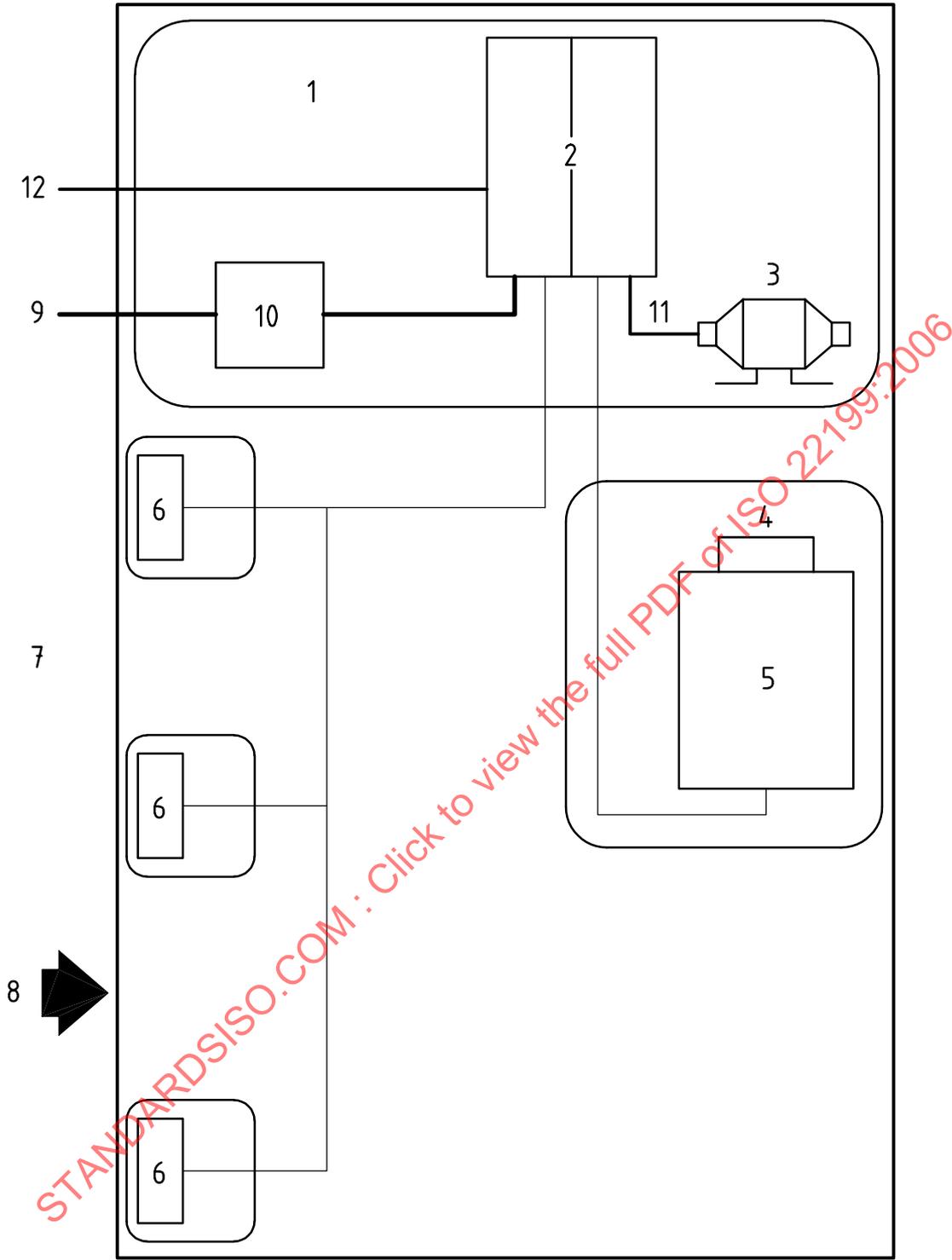
Frequency range MHz	Limits dB(μV)		
	Measurement with rated mains input current ^b		
	≪ 25 A	25 to 100 A	> 100 A ^d
0,15 ≤ F < 0,50	79 quasi peak 66 average	100 quasi peak 90 average	130 quasi peak 120 average
0,50 ≤ F < 5,0	73 quasi peak 60 average	86 quasi peak 76 average	125 quasi peak 115 average
5,0 ≤ F < 30	73 quasi peak 60 average	90 to 70 ^c quasi peak 80 to 60 ^c average	115 quasi peak 105 average

^a These values are based on the work of CISPR subcommittee B.

^b The current for which the apparatus has been designed.

^c Decreasing with logarithm of frequency.

^d This assumes a dedicated power supply from a specific transformer.



Key

- | | |
|---|------------------------------|
|  subsystem boundary | |
| 1 machine room | 7 floors |
| 2 main control | 8 installation 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 floor (e.g. push buttons, indicators) | 12 signal and control ports |

Figure 2 — EMC model (emission) for lift installations