

# Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods —

## Part 28: Remote alarm on passenger and goods passenger lifts

The European Standard EN 81-28:2003 has the status of a  
British Standard

ICS 13.320; 91.140.90

## National foreword

This British Standard is the official English language version of EN 81-28:2003.

The UK participation in its preparation was entrusted to Technical Committee MHE/4, Lifts, hoists and escalators, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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This British Standard, was published under the authority of the Standards Policy and Strategy Committee on 01 July 2003

### Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 15 and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

### Amendments issued since publication

Amd. No.	Date	Comments

© BSI 01 July 2003

ICS 13.320; 91.140.90

English version

**Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 28: Remote alarm on passenger and goods passenger lifts**

Règles de sécurité pour la construction et l'installation des ascenseurs - Elévateurs pour le transport de personnes et d'objets - Partie 28: Téléalarme pour ascenseurs et ascenseurs de charge

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Aufzüge für den Personen- und Gütertransport - Teil 28: Fern-Notruf für Personen- und Lastenaufzüge

This European Standard was approved by CEN on 13 February 2003.

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## Foreword

This document (EN 81-28:2003) has been prepared by Technical Committee CEN/TC 10, "Passenger, goods and service lifts", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by December 2003, and conflicting national standards shall be withdrawn at the latest by December 2003.

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.

This document is part of the EN 81 series of standards: "*Safety rules for the construction and installation of lifts*". This is the first edition.

Annex A is normative.

Annex B is informative.

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## **Introduction**

This European Standard is a type C standard as stated in EN 1070. This standard has been prepared to be a harmonised standard to provide one means of conforming to the essential safety requirements of the Lift Directive.

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

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 lifts that have been designed and built according to the provisions of this type C standard.

While drafting this standard it was assumed that:

- 1) The communication network (see annex A) does not fail.
- 2) The power supply network failure does not occur so that all the lifts in a geographical area do not create entrapment simultaneously.
- 3) This standard is used in conjunction with the corresponding standards of EN 81 series.

This standard also provides general information about the level of service provided by a rescue organisation.

## 1 Scope

This standard applies to alarm systems for all types of passenger and goods passenger lifts, in particular those covered in the EN 81 series of standards.

This standard also deals with the minimum information given to the owner of the installation related to maintenance and rescue service.

This standard deals with the following significant hazard relevant to lifts when they are used as intended and under the conditions foreseen by the installer/manufacture:

— Entrapment of users due to the lift not working properly.

This standard is not applicable to alarm systems intended to be used to call for help in other cases, e.g. heart attack, seeking information.

This standard is applicable to alarm systems used for lifts manufactured and installed after the date of publication by CEN of this standard. However, this standard may be taken into account when applied to existing lifts.

EN 81-70 gives additional requirements for persons with disabilities.

This standard supersedes EN 81-1:1998 and EN 81-2:1998 with regard to remote alarm (clause 14.2.3).

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 81-1:1998, *Safety rules for the construction and installation of lifts — Part 1: Electric lifts.*

EN 81-2:1998, *Safety rules for the construction and installation of lifts — Part 2: Hydraulic lifts.*

EN 81-70:2003, *Safety rules for the construction and installations of lifts – Part 70: Particular applications for passenger and good passenger lifts – Accessibility to lifts for persons including persons with disability.*

EN 292-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology.*

EN 292-2, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications.*

EN 1070:1998, *Safety of machinery — Terminology.*

EN 13015:2001, *Maintenance for lifts and escalators – Rules for maintenance instructions.*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 81-1:1998 and EN 81-2:1998 and EN 1070:1998 apply as well as the following additional definitions:

### 3.1

#### **alarm**

status between the activation of the alarm initiating device and the end of the alarm

**3.2  
acknowledgement**

information issued by the rescue service destined for the alarm equipment in order to inform it that the alarm has been taken into account

**3.3  
alarm equipment**

part of the alarm system able to detect, identify, validate as true alarm and initiate 2-way communication. The alarm equipment is part of the lift

**3.4  
end of alarm**

information issued by the alarm system and destined for the rescue service in order to inform it that the entrapment situation is ended

**3.5  
alarm initiation device**

device(s) intended for users trapped in the installation in order to call for external assistance, exemplified in annex A

**3.6  
alarm system**

combination of alarm initiation device(s) and alarm equipment(s) exemplified in annex A

**3.7  
human response**

response performed directly by a person of the rescue service via the alarm system

**3.8  
reception equipment**

equipment outside of the lift (e.g. at the rescue service) capable of handling alarm information and 2-way communication. Exemplified in annex A

**3.9  
rescue service**

organisation in charge of receiving alarms information and rescuing users trapped in the installation, exemplified in annex A. A rescue service can be part of the maintenance organisation. See annex B

**3.10  
transmitter**

part of a 2-way communication between the alarm system and the reception equipment exemplified in annex A

**3.11  
owner of the installation**

natural or legal person who has the power of disposal of the installation and takes the responsibility for its operation and use including rescuing of trapped users

**3.12  
installer**

natural or legal person who takes responsibility for the installation of the lift(s) including the alarm system

**3.13  
manufacturer of the alarm system**

natural or legal person who takes responsibility for the design, manufacture and placing alarm systems on the market

**3.14  
installation**

completely installed passenger lift or passenger goods lift including alarm system(s)

### 3.15

#### **maintenance organisation**

company or part of company where competent maintenance person(s) carry out maintenance operations on behalf of the owner of the installation

## **4 Safety requirements and/or protective measures**

### **4.1 General**

Alarm systems shall comply with the safety requirements and/or protective measures of clause 4.

In addition, alarm systems shall be designed according to the principles of EN 292-1 and EN 292-2 for hazards relevant but not significant which are not dealt with by this document (e.g. sharp edges).

#### **4.1.1 Alarms**

The alarm equipment shall ensure that subject to 4.1.5 alarm filtering, the full alarm information (see 4.1.6) will be emitted until acknowledgement, even during maintenance.

If an emission fails before acknowledgement, the delay between re-emission(s) shall be reduced to the minimum compatible with the communication network (see EN 81-1:1998, 0.2.5 and EN 81-2:1998, 0.2.5).

Where the characteristics of the communication network require (see EN 81-1:1998, 0.2.5 and EN 81-2:1998, 0.2.5) and if the communication is interrupted any re-emission after acknowledgement shall not be impeded by the alarm equipment. The alarm system shall be able to accept communication from the rescue service until the end of the alarm has occurred.

Emission of the alarm information to the transmitter shall not be delayed, except during filtering.

Between the acknowledgement and the end of alarm, any filtering shall be bypassed.

After acknowledgement, if the communication is interrupted, the alarm equipment shall stop automatic re-emission.

#### **4.1.2 End of alarm**

Means shall be provided to enable indication, from the alarm system to the rescue service, that the alarm has been dealt with and no user is trapped in the lift.

The end of alarm shall only be initiated from the installation to which the alarm belongs. The means to initiate the end of alarm shall be out of the reach of any non competent person.

Provision shall be made that the alarm equipment allows for remote resetting.

#### **4.1.3 Emergency electrical power supply**

Any alarm shall not be impeded or lost even in cases of electrical power supply switching or power supply failure.

Where a rechargeable emergency electrical power supply is used, means shall be provided to inform automatically the rescue service as soon as the capacity is lower than needed to provide one hour of function of the alarm system.

#### **4.1.4 Information in the lift car**

A visible and audible signal shall correspond with the requirement of EN 81-70:2003, 5.4.4.3 and inform the passenger(s) that the initiated alarm has been validated as a true alarm.

## **EN 81-28:2003 (E)**

### **4.1.5 Alarm filtering**

Provision shall be made to enable the alarm system to filter undue alarms.

For this purpose the filter shall be capable to eliminate the alarm when any of the following events occur:

- when the car is in an unlocking zone and the car and landing doors are fully open.
- the car is running and doors are opening at the next landing stop.

However, no alarms initiated during maintenance and/or repair shall be discarded.

The alarm system shall also provide means to allow the rescue service to deactivate and reactivate filtering of the alarm.

### **4.1.6 Identification**

The alarm equipment shall enable the rescue service to identify at least the installation even when testing.

### **4.1.7 Communication**

After initiation of the alarm initiation device, no further action from the trapped users shall be necessary.

After initiation of the alarm, the passenger shall not be able to interrupt the 2-way communication. The user shall always, during the alarm, be able to re-initiate it.

## **4.2 Technical characteristics**

### **4.2.1 Availability / reliability**

The alarm system shall be able to operate at all times when the lift is intended to be accessed by users (see EN 81-1:1998, 0.2.5 and EN 81-2:1998, 0.2.5).

The alarm equipment shall be able to emit alarm information to an alternative reception equipment.

The alarm equipment shall automatically simulate the input signal of an alarm (automatic test) and set up the subsequent connection to the reception equipment for testing purposes as frequently as required by the safety of users when the lift is used as intended, but at least every 3 days.

### **4.2.2 Electrical interface**

Any electrical interface between the alarm system and components of safety circuits of the lift shall comply with the requirements of EN 81-1:1998, 13.2.2 and 14.1.2.1.3 or EN 81-2:1998, 13.2.2 and 14.1.2.1.3.

### **4.2.3 Alarm initiation device**

Alarm initiation device(s) shall be installed at places where there is a risk of entrapment of users. The car alarm initiation device(s) shall generally be located at the control panel(s).

NOTE In order to maintain the integrity of the alarm function, the alarm initiation device should be vandal resistant in accordance with prEN 81-71.

### **4.2.4 Accessibility to alarm equipment**

The alarm equipment shall be installed at the car (but not accessible to passenger(s)), in the well or in a machinery/pulley area.

#### 4.2.5 Modification of parameters

Access to parameters of the alarm system functionality shall be protected by adequate means such as access codes.

## 5 Information

### 5.1 Information to be provided with the alarm system

The manufacturer of the alarm system shall inform the installer about the following:

- instructions for installation, testing and safe maintenance;
- separate information to be passed over to the owner of the installation in relation to 5.3, in particularly the information about testing the 2-way communication system (manual test) and the periodicity of the test.

### 5.2 Information to be provided with the lift

The installer shall inform the owner of the installation about the following:

- the need for the owner of the installation to assure that the lift is connected to a rescue service;
- information that has to be passed over to the rescue service see 5.3;
- the need to keep the alarm equipment in working conditions at all times to provide 2-way communication with a rescue service;
- the need to remove the installation from service when the 2-way communication is out of order;
- periodical checking of the voice response coming from the rescue service, by using the alarm initiation device(s) (manual test), see also EN 13015:2001, 4.3.2.16.a);
- information for use of alarm systems;
- the minimum maintenance requirements for the alarm system;
- information about how to change dialling parameters e.g. telephone numbers where they are included in the alarm equipment.

### 5.3 Information to be provided by the owner of the installation to the rescue service

The owner of the installation shall inform the rescue service about the following:

- the general instructions/information of the installer taking also into account the requirements of this standard;
- the need to establish at all time 2-way communication enabling contact with trapped users including the ability to speak regularly with them and to inform them about the status of the rescue operation;

NOTE the owner of the installation can ask for human response in a more specific language(s) in addition to the official language(s) (see EN 81-1:1998, 0.2.5 and EN 81-2:1998, 0.2.5);

- the information provided by the installer about interfacing to the alarm system;
- periodic checks;
- automatic tests;

- address originating the alarm, including location of the lift;
- building organisation including necessary availability of the rescue service, e.g. in each 24 h period;
- description of means to gain access to the trapped user(s);
- any special risks related to entering the building and obtaining access to the installation;
- the need to ensure compatibility between equipment to enable fully and correctly receiving and identifying the alarm(s) before the acknowledgement is sent to the alarm equipment;
- inform about the limits in time of the emergency power supply to the alarm system.

## **6 Test before putting into service**

Tests before putting into service shall cover the function of the alarm system.

NOTE The examination and test of the whole installation should be in accordance with the corresponding standards of the EN 81 series.

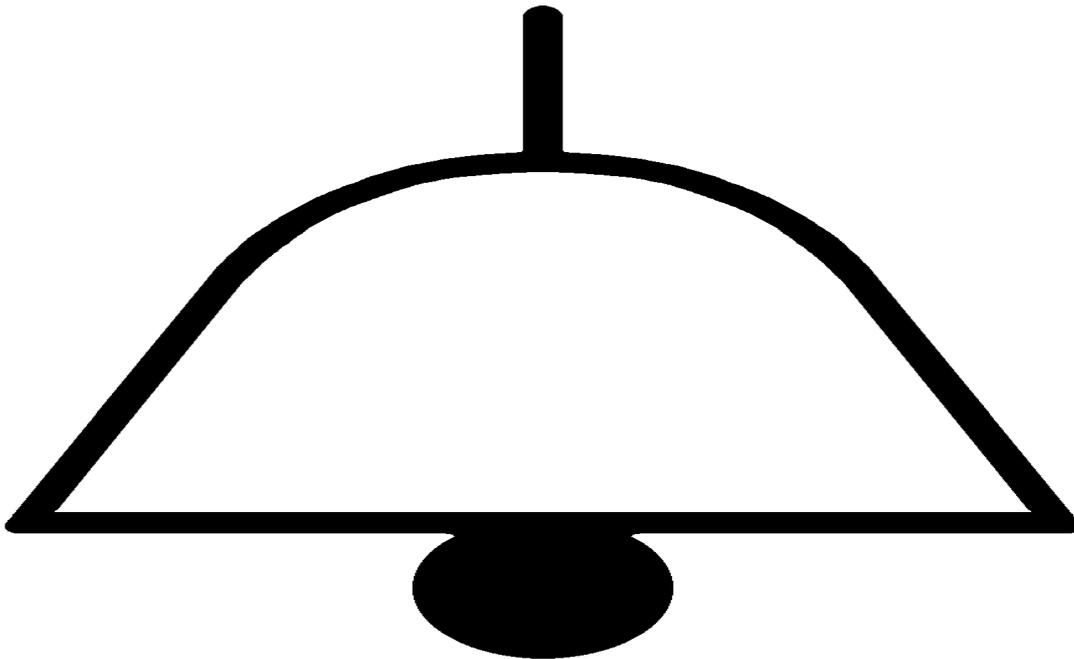
## **7 Marking, notices**

The minimum marking in the car shall include:

- indication that the car is equipped with an alarm system and linked with a rescue service;

NOTE Pictograms may be used.

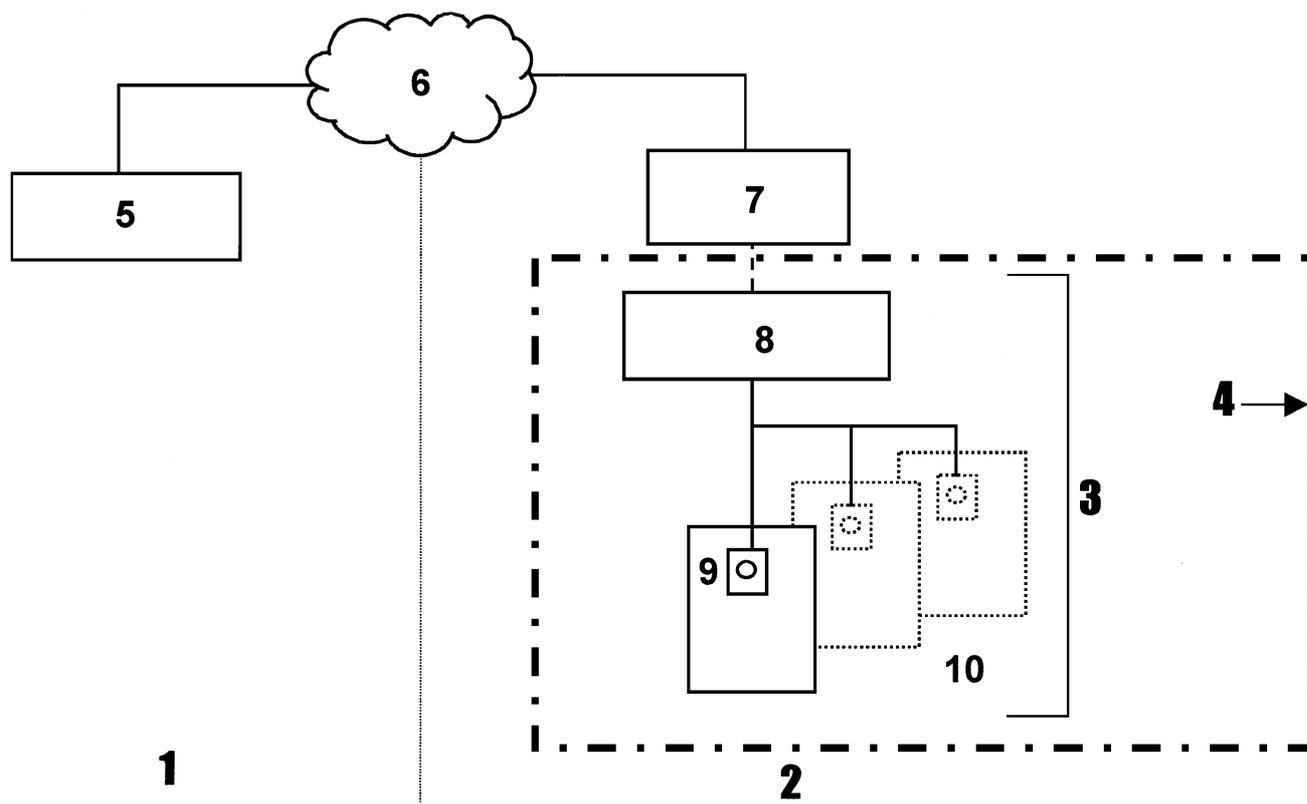
- The alarm initiating device, e.g. button of the alarm switch, touch screen etc. shall be yellow in colour and identified by the symbol:



**Figure 1 — Alarm bell**

## Annex A (normative)

### Typical 2-way communication between lift(s) and rescue service



#### Key

- 1 Rescue service
- 2 Site
- 3 Alarm system
- 4 Boundary of this standard
- 5 Reception equipment
- 6 Communication network
- 7 Transmitter
- 8 Alarm equipment
- 9 Alarm initiation device
- 10 Lifts

Figure A.1 – Typical 2-way communication between lift(s) and rescue service

## Annex B (informative)

### General information for the operation of rescue services

#### B.1 General

A risk analysis has shown that a rescue service should provide organisational measures to ensure that a trapped user will be released within the shortest possible time.

The rescue service should carry out a risk assessment to determine that its procedures, organisational structure etc. are able to provide an adequate service.

The rescue service should take into account the installers instructions and any information supplied by the owner of the installation.

The following gives guidance on how a rescue service should carry out its task.

NOTE Where national regulation differs in a more stringent way for rescue services, it applies.

#### B.2 Operation

The alarm system is to allow 2-way communication enabling adequate contact between trapped users and a rescue service. The equipment of a rescue service should at all times be fit to provide this service and the rescue service should be capable of responding quickly to any alarm.

If there is a possibility of the alarm requiring service at any time of the day to rescue users, adequate signifies 24 h operation.

If the installation does not demand 24 h operation for users, then the guarantee of rescue can be limited to the hours of its operation.

In order to increase safety for intervention people and to reduce risk of a prolonged trapping, the intervention process including gaining access to the building should be managed, followed up and recorded by the rescue service to ensure that the release is successful.

#### B.3 Response time

The rescue service should ensure that the time between the reception of the alarm information and the emission of the acknowledgement of the alarm in the rescue service is not longer than five minutes under normal conditions.

For this reason, the rescue service needs sufficient capability in respect of:

- the hardware capacity necessary to manage the number of connected installations (especially sufficient communication means);
- human resources, especially if the rescue service chooses to deactivate the alarm filtering;
- trained persons to rescue trapped users;
- back-up facilities (see B.6).

After acknowledgement of the alarm, the time to intervention on site should be as short as possible i.e. not more than one hour under normal conditions, e.g. without traffic jam, adverse weather condition, etc.

## B.4 Identification

To minimise the intervention time and increase safety of persons involved in the rescue, the rescue service should have available as soon as an alarm has been received, information necessary for rescuing, such as:

- a) address originating the alarm, including location of the installation;
- b) identification of the car;
- c) description of means to get access to the trapped user(s);
- d) any hazards and risks related to entering the building and obtaining access to the installation.

## B.5 Communication

The rescue service should check that the identification of the alarm has been fully and correctly received before the acknowledgement is sent to the alarm system and the human response is given.

The human response should be given at least in the official language(s) of the country where the lift is located.

The rescue service should be able to re-establish at all time 2-way communication with the trapped users in order to inform them about the status of the rescue operation.

Where the rescue service feel it is necessary, e.g. to avoid panic, it should be able to speak regularly with trapped users.

## B.6 Back-up service

In the event that the rescue service becomes unable to receive or manage the alarms, an appropriately resourced back-up service should be provided.

## B.7 Periodic testing

The rescue service should manage and control all periodic tests in accordance with 4.2.1 and 5.2 and should take appropriate actions in the event of a failure.

## B.8 Training

Persons in charge of dealing with alarm(s) should be trained and supplied with the necessary tools. Special consideration should be given to safe resetting of the alarm equipment, if any.

Persons in charge of rescuing trapped users should be trained according to EN 13015:2001, 6.1.

**Annex ZA**  
(informative)

**Clauses of this European Standard addressing essential requirements or other provisions of EU Directives.**

This European standard 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 95/16/CE Directive (Lift Directive).

**WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.**

This standard is likely to support requirements of Directive: 95/16/CE.

Compliance with this standard provides one means of conforming with the specific essential requirements of the Directive concerned and associated EFTA regulations.

## Bibliography

- [1] prEN 81-71, Safety rules for the construction and installations of lifts – Part 71: Particular applications for passenger and goods passenger lifts – Vandal resistant lifts.
- [2] TBR 21:1998, *Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public switched telephone networks (PSTNs) of TE (excluding TE supporting the voice telephone service) in which network addressing, if provided, is by means of dual tone multi frequency (DTMF) signalling.*
- [3] TR 101 150 v1.1.1:May 1998, *Report on the application of TBR 21.*

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