
**Fire detection and alarm systems —
Part 1:
General and definitions**

*Systèmes de détection et d'alarme d'incendie —
Partie 1: Généralités et définitions*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 21, *Equipment for fire protection and firefighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

This third edition cancels and replaces the second edition (ISO 7240-1:2005), which has been technically revised.

ISO 7240 consists of the following parts, under the general title *Fire detection and alarm systems*:

- *Part 1: General and definitions*
- *Part 2: Control and indicating equipment*
- *Part 3: Audible alarm devices*
- *Part 4: Power supply equipment*
- *Part 5: Point-type heat detectors*
- *Part 6: Carbon monoxide fire detectors using electro-chemical cells*
- *Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*
- *Part 8: Carbon monoxide fire detectors using an electro-chemical cell in combination with a heat sensor*
- *Part 9: Test fires for fire detectors* [Technical Specification]
- *Part 10: Point-type flame detectors*
- *Part 11: Manual call points*
- *Part 12: Line type smoke detectors using a transmitted optical beam*
- *Part 13: Compatibility assessment of system components*

- Part 14: Design, installation, commissioning and service of fire detection and fire alarm systems in and around buildings
- Part 15: Point type fire detectors using scattered light, transmitted light or ionization sensors in combination with a heat sensor
- Part 16: Sound system control and indicating equipment
- Part 17: Short-circuit-isolators
- Part 18: Input/output devices
- Part 19: Design, installation, commissioning and service of sound systems for emergency purposes
- Part 20: Aspirating smoke detectors
- Part 21: Routing equipment
- Part 22: Smoke-detection equipment for ducts
- Part 23: Visual alarm devices
- Part 24: Sound system loudspeakers
- Part 25: Components using radio transmission paths
- Part 27: Point-type fire detectors using a scattered-light, transmitted-light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor
- Part 28: Fire protection control equipment

The following parts are in preparation

- Part 29: Video fire detectors

Introduction

ISO 7240 (all parts) specifies components of fire detection and alarm systems, requirements for their interconnection and installation and the performance, testing, and servicing of parts or of complete systems. It provides

- local and/or remote signals to organizations having authority to respond to fire alarms, and
- signals to initiate the operation of fire protection equipment and other systems.

A fire detection and alarm system may be activated by automatic detection devices or by manual operation and should fulfil its functions without errors or omissions, including

- detecting quickly enough to fulfil its intended function,
- reliably transmitting the detection signal to the control and indicating equipment and, if applicable, the fire alarm receiving station,
- translating the detection signal into a clear alarm signal that will attract the attention of occupants in an immediate and unmistakable way,
- remaining insensitive to phenomena other than those which its function is to detect, and
- signalling immediately and clearly any supervised fault that might jeopardize the correct performance of the fire detection and alarm system.

A fire detection and alarm system should not

- be adversely affected by any other systems whether associated with it, or not
- be rendered partially or totally inoperative by the fire or the phenomenon which it is designed to detect before the fire or phenomenon has been detected.

ISO 7240 (all parts) applies to fire detection and alarm systems installed in and around buildings. It can be used as a basis for the assessment of systems for other purposes, e.g. mines, ships, but the specific nature of each application should be considered before use. Additional performance and environmental tests may be necessary. It does not preclude the manufacture or use of systems having special characteristics suitable for protection of specific risks against specific hazards.

A fire detection and alarm system is required to function satisfactorily not only in the event of fire, but also during and after exposure to conditions likely to be met in practice such as corrosion, vibration, direct impact, indirect shock, and electromagnetic interference. Some tests specified are intended to assess the performance of system components under such conditions.

The performance of components of fire detection and alarm systems is assessed from the results obtained in the specific tests. The compliance of a component with the relevant part of ISO 7240 does not necessarily ensure that the component will function correctly when connected with another component also conforming to the relevant part of ISO 7240 (e.g. a fire detector with fire detection control and indicating equipment), unless both components have been assessed together as conforming to the requirements for a fire detection and alarm system. Requirements for the assessment of the compatibility of system components are specified in ISO 7240-13. Satisfactory operation of an installed system should be confirmed by testing after completion of the installation (see ISO 7240-14). ISO 7240 (all parts) is not intended to place any other restrictions on the design and construction of such components.

If appropriate, ISO 7240 (all parts) can be applied to the detection part of extinguishing systems, excluding sprinkler heads, although the sensitivity requirements might not be applicable in every instance.

As this revision of this part of ISO 7240 includes terms and definitions collated from other parts of ISO 7240, there may now be some duplication and minor variances which will be corrected in future revisions of the other parts of ISO 7240.

Fire detection and alarm systems —

Part 1: General and definitions

1 Scope

This part of ISO 7240 provides a set of general guidelines and definitions used in describing the fire detection and alarm system (FDAS) equipment installed in and around buildings, and the tests and requirements for these equipments in the other parts of ISO 7240.

ISO 7240 does not apply to smoke alarms, the requirements for which are specified in ISO 12239.

2 Terms and definitions and abbreviated terms

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

2.1 Definitions

2.1.1

A-weighted sound pressure level
twenty times the logarithm to base ten of the ratio of the root-mean-square A-weighted sound pressure to the reference pressure of 20 μPa at 1 kHz, expressed in decibels

Note 1 to entry: The A-weighting characteristics are given in IEC 61672-1.

2.1.2

absorbance index

cf. *m* (2.1.83)

2.1.3

access level

one of several states of equipment in which selected

- controls can be operated,
- manual operations can be carried out,
- indications are visible, and/or
- information can be obtained

2.1.4

addressable point

point which can be individually identified at the control and indicating equipment (see [Figure 1](#), items B and M)

Note 1 to entry: Compare *point* (2.1.101).

2.1.5

aerosol density

smoke density

amount of particulates per volume as described operationally by one of two parameters:

- m (2.1.83), an absorbance index, used in the testing of smoke detectors using scattered or transmitted light;
- y (2.1.141), a dimensionless variable, used in the testing of smoke detectors using ionization

Note 1 to entry: These parameters are not concentrations *sensu stricto*, but represent values which are proportional to the concentration and have been shown to function in lieu of a true concentration value for the purposes of tests.

**2.1.6
alarm**

signal, or condition, warning of an emergency

**2.1.7
alarm indication**

indication (at the indicating equipment, see [Figure 1](#), items B and M) to show that a detection signal has been received

**2.1.8
alert signal**

audible signal complying with ISO 7731 or visual signal or a combination of audible and visual signals that call attention to the possibility of a hazardous or dangerous situation

**2.1.9
alphanumeric display**

indicator capable of giving information by the display of messages consisting of text and/or numeric characters

**2.1.10
analogue detector**

detector which gives an output signal representing the value of the sensed phenomenon

Note 1 to entry: This may be a true analogue signal or a digitally encoded equivalent of the sensed value.

**2.1.11
ancillary equipment**

equipment which supports fire detection and fire alarm functions not currently defined in ISO 7240

Note 1 to entry: See [Figure 1](#), item N.

**2.1.12
ancillary function**

action performed by equipment not related to fire detection or fire alarm system

Note 1 to entry: See [Figure 1](#), item O.

**2.1.13
aspirating smoke detector**

smoke detector, in which air and aerosols are drawn through a sampling device and carried to one or more smoke-sensing elements by an integral aspirator (e.g. fan or pump)

Note 1 to entry: Each smoke sensing element may contain more than one sensor exposed to the same smoke sample.

**2.1.14
audible alarm device**

AAD
component intended to signal an audible warning of fire to the occupants of a building

Note 1 to entry: AADs are sometimes referred to as “fire alarm sounders”.

2.1.15**cabinet**

housing that affords a degree of protection and robustness to its constituent parts and subassemblies

2.1.16**certification**

third party attestation related to products, processes, systems, or persons

[SOURCE: ISO 1700:2004, 5.5]

2.1.17**combination detector**

detector combining two or more detecting principles in a single housing

2.1.18**combustion gas detector**

fire detector sensitive to gaseous products of combustion and/or thermal decomposition

EXAMPLE Carbon monoxide gas fire detector.

2.1.19**commissioning**

process that verifies the installed equipment or system meets the defined requirements

2.1.20**compatibility**

ability of a component of a FDAS to operate with another component of the same FDAS

2.1.21**competent person**

person who, in relation to the work undertaken, has the necessary knowledge, skill, and experience to complete the work satisfactorily and without danger or injury to any person

2.1.22**component**

device contained in one housing performing at least one or part of a function of a FDAS

EXAMPLE Fire detectors, alarm devices, and control and indicating equipment are components of a FDAS.

Note 1 to entry: Where a function is distributed in separate cabinets, each cabinet is considered as a separate component.

2.1.23**configuration**

arrangement of components of a FDAS specified by number, type, and topology, together with any necessary limits on the transmission paths

2.1.24**confirmation signal**

signal from a fire detector or manual call point which terminates a first alarm state

2.1.25**control and indicating equipment**

cf. *fire alarm control and indicating equipment* (2.1.46) and *fire detection control and indicating equipment* (2.1.56)

2.1.26**detachable detector**

detector which is designed for removal of the head from its base

2.1.27

detection circuit

transmission path which connects points to the FDCIE

Note 1 to entry: See [Figure 1](#), item B.

Note 2 to entry: Compare *point* ([2.1.101](#)) and *transmission path* ([2.1.130](#)).

2.1.28

detection concept

description of the design of the FDAS with a justification of the choice of detectors, its sensitivity and its spacing; description of the alarm organization, i.e. all measures to be taken in case of an alarm

2.1.29

detection signal

signal from a detection device (see [Figure 1](#), item A) to show that a fire has been detected

2.1.30

detector response

defined change of the status of a fire detector after actuation of an alarm signal

2.1.31

differential detector

detector which initiates an alarm when the difference (normally small) in the magnitudes of the measured phenomenon at two or more places exceeds a certain value for a specified time

2.1.32

documentation

drawings and instructions necessary to understand and to operate the FDAS

2.1.33

earth fault

unwanted connection between earth potential and any part of the control and indicating equipment (see [Figure 1](#), items B and M), transmission paths to the control and indicating equipment, or transmission paths between parts of the control and indicating equipment

2.1.34

emergency

imminent risk or serious threat to persons or property

2.1.35

emergency detection system

application intended for the protection of life, property, or the environment such as

- FDAS,
- gas detection system,
- intrusion and hold-up alarm,
- closed circuit television,
- access control, and
- manual call point

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2.1.36**emergency management plan**

documented procedure that considers all aspects of the management of an emergency to ensure the safety of building occupants

Note 1 to entry: The emergency management plan is likely to include the evacuation of building occupants, but under certain circumstances, the retention of occupants in their current locations can be preferable.

2.1.37**evacuation plan**

part of the emergency management plan dealing with the safe and orderly evacuation of building occupants

2.1.38**evacuate signal**

audible or visual signal or a combination of audible and visual signals complying with ISO 8201 that means “evacuate the building immediately”

2.1.39**fault warning routing equipment**

equipment which routes a fault warning signal to a fault warning receiving station

Note 1 to entry: See [Figure 1](#), item J.

2.1.40**fault warning receiving station**

centre from which the necessary corrective measures can be initiated on receipt of a fault signal

Note 1 to entry: See [Figure 1](#), item K.

2.1.41**field**

subdivision of a window

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Note 1 to entry: See *fault warning receiving station* ([2.1.40](#)).

2.1.42**final voltage**

lowest recommended voltage to which a battery should be discharged

Note 1 to entry: The final voltage is specified by the battery manufacturer.

2.1.43**fire alarm and fault warning transmission system**

system used for routing fire alarm and fault warning signals from FDAS to fire alarm and fault warning receiving stations

2.1.44**fire alarm circuit**

DEPRECATED: sound system alarm circuit

transmission path that connects the FACIE to loudspeaker, AAD or VAD

2.1.45**fire alarm condition**

DEPRECATED: sound system alarm condition

audible voice or tone signal (recorded or live) operating in one or more emergency zones

2.1.46**fire alarm control and indicating equipment****FACIE**

DEPRECATED: sound system control and indicating equipment component that is used to