
**Fire detection and alarm systems —
Part 2:
Control and indicating equipment**

Systèmes de détection et d'alarme d'incendie —

Partie 2: Équipement de contrôle et de signalisation

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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 7240-2 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

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

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- *Part 1: General and definitions*
 - *Part 2: Control and indicating equipment* [ISO 7240-2:2003](https://standards.iteh.ai/catalog/standards/sist/44a6e859-bc54-4b8b-8bb7-b20f798bec2e/iso-7240-2-2003)
 - *Part 4: Power supply equipment*
 - *Part 5: Point-type heat detectors*
 - *Part 6: Point-type fire detectors for carbon monoxide*
 - *Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*
 - *Part 11: Manual call points*
 - *Part 14: Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings* [Technical Report]
 - *Part 15: Point-type multisensor (light and heat) fire detectors*

Compatibility assessment of system components and carbon monoxide point-type fire detectors using electrochemical cells are to form the subjects of future Parts 13 and 16.

Introduction

This part of ISO 7240 is drafted on the basis of mandatory functions, which are to be provided on all control and indicating equipment, and optional functions (with requirements) which may be provided. It is intended that the options be used for specific applications, as recommended in application guidelines.

Each optional function is included as a separate entity, with its own set of associated requirements, in order to permit control and indicating equipment with many different combinations of functions to comply with this part of ISO 7240.

Other functions associated with fire detection and alarm may also be provided, even if not specified in this part of ISO 7240.

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Fire detection and alarm systems —

Part 2: Control and indicating equipment

1 Scope

This part of ISO 7240 specifies requirements, test methods and performance criteria for control and indicating equipment (c.i.e.) for use in fire detection and fire alarm systems installed in buildings.

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.

ISO 7240-1:1988, *Fire detection and alarm systems — Part 1: General and definitions*

ISO 7240-4, *Fire detection and alarm systems — Part 4: Power supply equipment*

ISO 7240-7, *Smoke detectors — Part 7: Point detectors using scattered light, transmitted light or ionization*

ISO 8201, *Acoustics — Audible emergency evacuation signal*

IEC 60068-1, *Environmental testing — Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing — Part 2: Tests. Tests A: cold*

IEC 60068-2-2, *Environmental testing — Part 2: Tests. Tests B: dry heat*

IEC 60068-2-3, *Environmental testing — Part 2: Tests. Test Ca: damp heat, steady state*

IEC 60068-2-6, *Environmental testing — Part 2: Tests. Test Fc: vibration (sinusoidal)*

IEC 60068-2-47, *Environmental testing — Part 2: Test methods — Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests*

IEC 60068-2-75, *Environmental testing — Part 2: Tests — Test Eh: Hammer tests*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-3, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use and weather protected locations*

EN 50130-4, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7240-1 and the following apply. See also Figure 1 of ISO 7240-1:1988.

3.1

access level

one of several states of a c.i.e. in which selected

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

See annex A.

3.2

addressable point

point which can be individually identified at the c.i.e.

cf. **point** (3.15)

3.3

alphanumeric display

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

3.4

confirmation signal

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

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3.5

detection circuit

transmission path which connects points to the c.i.e.

cf. **point** (3.15) and **transmission path** (3.22)

3.6

earth fault

unwanted connection between earth potential and any part of the c.i.e., transmission paths to the c.i.e. or transmission paths between parts of the c.i.e.

3.7

field

sub-division of a window

3.8

first alarm signal

signal from a fire detector or manual call point which is interpreted as a fire alarm, but following which the c.i.e. enters a first alarm state

3.9

first alarm state

state of the c.i.e. following the receipt of a first alarm signal during which mandatory functions of the c.i.e. may be inhibited

3.10**functional condition**

condition of the c.i.e. characterized by its indication at the c.i.e.

NOTE The functional conditions recognized in this part of ISO 7240 are the following:

- fire alarm condition, when a fire alarm is indicated;
- supervisory signal condition, when a supervisory signal is indicated;
- fault warning condition, when a fault is indicated;
- disabled condition, when the disablement of functions is indicated;
- test condition, when the testing of functions is indicated;
- quiescent condition, when the c.i.e. is powered by a power supply in accordance with ISO 7240-4 and no other functional condition is indicated.

3.11**indicator**

a device which can change its state to give information

3.12**indication**

information given by an indicator

3.13**mandatory** adj.

qualification applied to those functions required to be provided on all c.i.e. and the functions' requirements and to the requirements of any optional functions that have requirements, if such optional functions are provided

3.14**non-volatile memory**

memory elements which do not require the presence of an energy source for the retention of their contents

3.15**point**

component connected to a detection circuit able to transmit or receive information in relation to fire detection

NOTE

Includes Items A and D in Figure 1 of ISO 7240-1:1988.

3.16**program**

software necessary for c.i.e. to comply with at least the requirements of this part of ISO 7240, including initializing data, reset and interrupt vectors, operating code and declarations

3.17**reset**

operation capable of terminating the fire alarm condition and/or the fault warning condition

3.18**running data**

alterable data subject to temporary modification during operation, either automatically or by manual controls

3.19**separate** adj.

physically separate and exclusively provided for the purpose or purposes stated in this part of ISO 7240

3.20

silencing n.

manual operation for switching off the audible signal of a sounding device which is capable of being automatically re-sounded by a new event

3.21

site-specific data

alterable data required for the c.i.e. to operate in a defined system configuration

3.22

transmission path

connection, external to the cabinet of the c.i.e., for the transmission of information and/or power

— between the c.i.e. and other components of a fire detection and fire alarm system as defined in ISO 7240-1, and/or

— between parts of c.i.e. contained in different cabinets

3.23

volatile memory

memory elements which require the presence of an energy source for the retention of their contents

3.24

window

part or all of an alphanumeric display used for information relating to one functional condition at a given time.

NOTE A sub-division of the display may be realized either by mechanical separation, or under software control

3.25

zone

geographical sub-division of the protected premises in which one or more points are installed and for which a common zonal indication is provided

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4 General requirements

If an optional function with requirements is included in the c.i.e., then all the corresponding requirements shall be met (see also Annex B).

If functions other than those specified in this part of ISO 7240 are provided, they shall not jeopardize compliance with any requirement of this part of ISO 7240.

5 General requirements for indications

5.1 Display of functional conditions

5.1.1 The c.i.e. shall be capable of unambiguously indicating the following functional conditions, in accordance with Clauses 6 to 11:

- quiescent condition;
- fire alarm condition;
- supervisory signal condition;
- fault warning condition;

- disablement condition;
- test condition.

5.1.2 The c.i.e. shall be capable of being simultaneously in any combination of the following functional conditions:

- fire alarm condition;
- supervisory signal condition;
- fault warning condition;
- disablement condition;
- test condition.

5.2 Display of indications

All mandatory indications shall be clearly identifiable, except where otherwise specified in this part of ISO 7240.

5.3 Indications on alphanumeric displays

Where an alphanumeric display is used to display indications relating to different functional conditions, these may be displayed at the same time. However, for each functional condition there shall be only one window, in which all of the fields relating to that functional condition shall be grouped.

5.4 Indication of supply of power

A visible indication shall be given by means of a separate light-emitting indicator while the c.i.e. is supplied with power.

5.5 Audible indications

The audible indication for the fire alarm condition may be the same as that for the fault warning condition. If they are different, the fire alarm indication shall have priority.

5.6 Additional indications

Where indications are used in addition to mandatory indications, these shall not result in contradiction or confusion.

6 Quiescent condition

Any kind of system information may be displayed during the quiescent condition. However, no indications shall be given which could be confused with indications used in the

- fire alarm condition,
- supervisory signal condition,
- fault warning condition,
- disabled condition, or
- test condition.

7 Fire alarm condition

7.1 Reception and processing of fire signals (see also Annex C)

7.1.1 The c.i.e. shall enter the fire alarm condition when signals are received which, after any necessary processing, are interpreted as a fire alarm.

7.1.2 The c.i.e. shall be capable of receiving, processing and indicating signals from zones. A signal from one zone shall not falsify the processing storing and/or indication of signals from other zones.

7.1.3 Except where 7.11 or 7.12 applies, the time taken by scanning, interrogation, or other processing of signals from fire detectors, in addition to that required to take the fire alarm decision, shall not delay the indication of the fire alarm condition, or of a new zone in alarm by more than 10 s.

7.1.4 The c.i.e. shall enter the fire alarm condition within 10 s of the activation of any manual call point.

7.1.5 The mandatory indications and/or outputs shall not be falsified by multiple fire signals received from the same or different detection circuits as a result of the simultaneous operation of two points, the operation of further points or both.

7.2 Indication of fire alarm condition

The fire alarm condition shall be indicated without prior manual intervention. The indication is established when all of the following are present:

- a) a visible indication, by means of a separate light-emitting indicator (the general fire alarm indicator);
- b) a visible indication, as specified in 7.3, of the zones in alarm, which may be omitted for c.i.e. capable of receiving signals from only one zone;
- c) an audible indication, as specified in 7.4.

7.3 Indication of zones in alarm (see also Annex D)

7.3.1 The zones in alarm shall be visibly indicated by means of a separate light-emitting indicator for each zone or an alphanumeric display or both.

7.3.2 If the zonal indications are on an alphanumeric display which because of its limited capacity cannot simultaneously indicate all the zones in alarm, at least the following shall apply:

- a) the first zone in alarm shall be displayed in a field at the top of the display;
- b) additional zones in alarm shall be displayed in another field until the c.i.e. has been reset;
- c) the total number of zones in alarm shall be permanently displayed;
- d) zones in alarm not currently indicated shall be capable of being displayed at Access Level 1 or 2. A single manual action shall be required for each display of zonal information.

7.4 Audible indication

7.4.1 The audible indication shall be capable of being silenced by means of a separate manual control at Access Level 1 or 2. This control shall only be used for silencing the audible indication, and may be the same as that used for silencing in the fault warning condition.

7.4.2 The audible indication shall not be silenced automatically.

7.4.3 The audible indication shall re-sound for each new zone in alarm.

7.5 Other indications during the fire alarm condition

7.5.1 If faults, disablements or tests are indicated by means of separate light-emitting indicators, and such indications are suppressed in the fire alarm condition, it shall be possible to reveal these by means of a manual operation at Access Level 1 or 2.

7.5.2 If the fire alarm indications are on an alphanumeric display, the following shall apply to the display of other information:

- a) information not related to the fire alarm condition shall be suppressed unless the display has more than one window, one of which is exclusively reserved for fire alarm indications;
- b) suppressed indications of faults and disablements shall each be capable of being displayed at any time by manual operations at Access Level 1 or 2. These operations shall be different from, or additional to, that specified in 7.3.2 d) for displaying zones in alarm.

7.6 Reset from fire alarm condition

7.6.1 The c.i.e. shall be capable of being reset from the fire alarm condition. This shall only be possible by means of a separate manual control, at Access Level 2. This control shall be used only for reset and may be the same as that used for reset from the fault warning condition.

7.6.2 Following a reset operation, the indication of the correct functional conditions, corresponding to any received signals, shall either remain, or be re-established, within 20 s.

7.7 Output of fire alarm condition

7.7.1 At least one output that signals the fire alarm condition shall be provided, which may be an output in accordance with 7.8, 7.9 or 7.10.

7.7.2 Except where 7.11 or 7.12 or both apply, the c.i.e. shall activate all mandatory outputs within 3 s of the indication of a fire alarm condition.

7.7.3 Except where 7.11 applies, the c.i.e. shall activate all mandatory outputs within 10 s of the activation of any manual call point.

7.8 Output to fire alarm devices — Optional function (see also 9.2.5 and 10.4.2)

The c.i.e. may have provision for the automatic transmission of fire alarm signals to fire alarm signalling devices (see item C of Figure 1 of ISO 7240-1:1988). In this case the following shall apply.

- a) It shall be possible to silence the fire alarm devices at Access Level 2.
- b) Following silencing, it shall be possible to re-sound the fire alarm devices at Access Level 2.
- c) Fire alarm devices shall not be silenced automatically.
- d) Following silencing, it shall be possible to automatically re-sound the fire alarm devices by an alarm in another zone.

7.9 Control of fire alarm routing equipment — Optional function (see also 9.2.5)

7.9.1 Output to fire alarm routing equipment

The c.i.e. may have provision for the automatic transmission of fire alarm signals to fire alarm routing equipment (Item E in Figure 1 of ISO 7240-1:1988). The transmission of the signal may be indicated by means of a separate light-emitting indicator or a field on the alphanumeric display or both. In this case, the indication shall remain until the fire alarm condition is reset.

7.9.2 Input from fire alarm routing equipment

Where the output specified in 7.9.1 is provided, the c.i.e. may have an input which is capable of receiving signals from fire alarm routing equipment (Item E in Figure 1 of ISO 7240-1:1988). In this case the reception of the signals shall be indicated by means of a separate light-emitting indicator or a field on the alphanumeric display or both. The light-emitting indicator may be used instead of the indicator specified in 7.9.1. The indication shall remain until the fire alarm condition is reset.

7.10 Output to fire protection equipment — Optional function [see also 9.2.4 f) and 10.4.1 b)]

7.10.1 Output type A

The c.i.e. may have provision for the transmission of fire alarm signals to controls for automatic fire protection equipment (Item G in Figure 1 of ISO 7240-1:1988).

7.10.2 Output type B

The c.i.e. may have provision for the transmission of fire alarm signals to controls for automatic fire protection equipment (Item G in Figure 1 of ISO 7240-1:1988). In this case the transmission of the signal shall be indicated by means of a separate light-emitting indicator or a field on the alphanumeric display or both. The indication shall be at least common to all such equipment, and shall not be suppressed during the fire alarm condition.

7.10.3 Output type C

The c.i.e. may have provision for the transmission of fire alarm signals to controls for automatic fire protection equipment (Item G in Figure 1 of ISO 7240-1:1988). In this case the reception of a confirmatory signal from such equipment shall be indicated by means of a separate light-emitting indicator or a field on the alphanumeric display or both. The indication shall be at least common to all such equipment, and shall not be suppressed during the fire alarm condition.

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7.10.4 Fault monitoring of fire protection equipment

The c.i.e. may have provision to receive fault warning signals from controls for automatic fire protection equipment (Item G in Figure 1 of ISO 7240-1:1988). These faults shall be indicated by means of a separate light-emitting indicator or a field on the alphanumeric display or both. The indication shall be at least common to all such equipment, and shall not be suppressed during the fire alarm condition. The indicator may be the same as that of 9.2.4 f).

7.11 Delays to outputs — Optional function (see also Annex E)

7.11.1 Configuration of delays

The c.i.e. may have provision to delay the activation of outputs to fire alarm devices (Item C in Figure 1 of ISO 7240-1:1988) or to fire alarm routing equipment (Item E in Figure 1 of ISO 7240-1:1988) or to controls for automatic fire protection equipment (Item G in Figure 1 of ISO 7240-1:1988), or all these. In these cases at least the following shall apply.

- a) The operation of delays to outputs to fire alarm signalling devices or outputs to automatic fire protection equipment shall be selectable at Access Level 3 to apply to
 - fire detectors, and/or
 - manual call points, and/or
 - signals from specific zones.

- b) The operation of delays to outputs to fire alarm routing equipment shall be selectable at Access Level 3, to apply to
 - fire detectors, and/or
 - signals from specific zones.
- c) The delay times shall be configurable at Access Level 3, in increments not exceeding 1 min, up to a maximum of 10 min.
- d) It shall be possible to override the delays and immediately activate delayed outputs by means of a manual operation at Access Level 1 or by means of a signal from a manual call point or by both means.
- e) The delay to one output signal shall not affect the activation of other outputs.

7.11.2 Control of delay

If the configuration is according to 7.11.1, the c.i.e. may have provision to switch on and switch off the delayed operation of outputs. In this case the following is applicable.

- a) Provision may be made to switch on and switch off delays, by means of a manual operation at Access Level 2.
- b) Provision may be made to automatically switch on and/or switch off delays by means of a programmable timer, which shall be configurable at Access Level 3.
- c) A separate light-emitting indicator or a field on the alphanumeric display or both shall be visible when the delayed operation of outputs is switched on. The indication shall not be suppressed during the fire alarm condition.

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7.12 Dependency on more than one alarm signal — Optional function

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7.12.1 Type A dependency

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Following the receipt of a first alarm signal, the entry to the fire alarm condition could be inhibited until the receipt of a confirmation alarm signal from the same fire detector, or from a fire detector in the same zone. In this case the following shall apply.

- a) The mode of operation shall be configurable at Access Level 3.
- b) The first alarm state need not be indicated.
- c) It shall be possible to receive a confirmation alarm signal at least from the same fire detector within 60 s of the receipt of the first alarm signal.
- d) The first alarm state shall be automatically cancelled within 30 min of the receipt of the first alarm signal.

7.12.2 Type B dependency

Following the receipt of a first alarm signal, the entry to the fire alarm condition may be inhibited until the receipt of a confirmation alarm signal from another fire detector, which may be in the same or a different zone. In this case the following shall apply.

- a) The mode of operation shall be configurable at Access Level 3.
- b) The first alarm state shall be indicated by means of
 - an audible indication, which may be the same as that in the fire alarm condition or fault warning condition, or
 - a visible indication of the affected zone, which may be the same as that for indication of the zone in alarm according to 7.3; the fire alarm indicator shall not be illuminated.