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Fire detection and alarm systems —

Part 2: Fire detection control and indicating equipment

Systèmes de détection et d'alarme d'incendie —

Partie 2: Équipement de contrôle et de signalisation

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Contents

Page

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ISO 7240-2:2017
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Foreword

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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).

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

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This second edition cancels and replaces the first edition (ISO 7240-2:2003), which has been technically revised.

A list of all the parts in the ISO 7240 series can be found on the ISO website.

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Introduction

The fire detection control and indication function (ISO 7240-1:2014, Figure 1, item B), within a fire detection and alarm system (FDAS) installed in and around buildings, is provided by the fire detection control and indicating equipment (FDCIE).

FDCIE receives signals from the fire detection function (ISO 7240-1:2014, Figure 1, item A) and the manual initiating function (ISO 7240-1:2014, Figure 1, item D). FDCIE processes received signals and may indicate information at the FDCIE and/or send signals to other functions within the fire detection and alarm system. The signals are used to provide notification to building occupants and other parties responsible for building safety in accordance with the design objectives for the fire detection and alarm system (see also ISO 7240-14 or equivalent national design standard).

This document is drafted on the basis of mandatory functions, which are provided on all fire detection control and indicating equipment, and optional functions (with requirements) which may be provided. It is intended that the options be used for specific applications, and to meet the fire detection and alarm system design objectives. Each optional function is included as a separate entity, with its own set of associated requirements, in order to permit fire detection control and indicating equipment with many different combinations of functions to comply with this document.

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

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https://standards.iteh.ai/catalog/standards/sist/8670b90d-5bed-4b80-9e6a-7f44cbddea72/iso-7240-2-2017

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Fire detection and alarm systems —

Part 2: Fire detection control and indicating equipment

1 Scope

This document specifies requirements, test methods and performance criteria for fire detection control and indicating equipment (FDCIE) for use in fire detection and fire alarm systems installed in buildings.

For the testing of other types of FDCIE, this document is intended to be used only for guidance. FDCIE with special characteristics, developed for specific risks, are not covered in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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ISO 7240-1:2014, *Fire detection and alarm systems — Part 1: General and definitions*

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

ISO 7240-14, *Fire detection and alarm systems — Part 14: Design, installation, commissioning and service of fire detection and fire alarm systems in and around buildings*

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 60068-2-6, *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 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state*

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*

IEC 62599-2, *Alarm systems — Part 2: Electromagnetic compatibility — Immunity requirements for components of fire and security alarm systems*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 7240-1 and the following apply.

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
functional condition
condition characterized by its indication

Note 1 to entry: The functional conditions recognized in this document 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 FDCIE is powered by a power supply in accordance with ISO 7240-4 and no other functional condition is indicated.

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3.2 Abbreviated terms

EMC electro-magnetic compatibility

IP ingress protection

PSE power supply equipment

ISO 7240-2:2017
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4 Requirements

4.1 General

4.1.1 FDCIE shall have provision for grouping the signals from points to provide zonal indications.

4.1.2 The processing of signals shall give the highest priority to the indication of fire alarms.

4.1.3 FDCIE shall be capable of unambiguously indicating the following functional conditions, in accordance with 4.3 to 4.8:

— quiescent condition;

— fire alarm condition;

— fault warning condition;

— disablement condition, where the condition is provided;

— test condition, where the condition is provided;

— supervisory signal condition, where the condition is provided.

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4.1.4 FDCIE shall be capable of being simultaneously in any combination of the following functional conditions:

— fire alarm condition;

— fault warning condition;

— disablement condition, where the condition is provided;

— test condition, where the condition is provided;

— supervisory signal condition, where the condition is provided.

4.2 Compliance

4.2.1 In order to comply with this document, FDCIE shall meet the following requirements.

a) Clause 4, which shall be verified by visual inspection or engineering assessment, shall be tested in accordance with Clause 5 and shall meet the requirements of the tests.

b) Clause 7 and 8, which shall be verified by visual inspection.

4.2.2 If an optional function with requirements is included in FDCIE, then all the corresponding requirements shall be met (see Annex A for a list of optional functions).

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

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4.3 Quiescent condition

ISO 7240-2:2017
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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,

— fault warning condition,

— disabled condition,

— test condition, or

— supervisory signal condition.

4.4 Fire alarm condition

4.4.1 Reception and processing of fire signals

4.4.1.1 FDCIE shall enter the fire alarm condition when signals are received which, after any necessary processing (see Annex B), are interpreted as a fire alarm.

4.4.1.2 FDCIE shall be capable of receiving, processing and indicating signals from fire detection zones. A signal from one fire detection zone shall not falsify the processing storing and/or indication of signals from other fire detection zones.

4.4.1.3 Except where 4.4.11 or 4.4.12 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 fire detection zone in alarm by more than 10 s.

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4.4.1.4 FDCIE shall enter the fire alarm condition within 10 s of the activation of any manual call point.

4.4.1.5 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.

4.4.2 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 red light-emitting indicator (the general fire alarm indicator);

b) a visible indication, as specified in 4.4.3, of the fire detection zones in alarm, which may be omitted for FDCIE capable of receiving signals from only one fire detection zone;

c) an audible indication, as specified in 4.4.4.

4.4.3 Indication of fire detection zones in alarm

4.4.3.1 The fire detection zones in alarm shall be visibly indicated by means of a separate red light-emitting indicator for each fire detection zone or an alphanumeric display or both (see also Annex C).

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

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a) the first fire detection zone in alarm, in a field at the top of the display;

b) additional fire detection zones in alarm, in another field;

c) the total number of fire detection zones in alarm;

d) fire detection zones in alarm not currently indicated, at access level 1 or 2. A single manual action shall be required to display each zonal information. Fields or the alarm window, may be temporarily suppressed to permit the display of additional fire detection zones in alarm; however, if there is no further manual intervention, the display shall meet the requirements of 4.4.3.2 a), 4.4.3.2 b) and 4.4.3.2 c) within 30 s of the suppression.

4.4.4 Audible indication

4.4.4.1 The audible indication shall be capable of being silenced at access level 1 or 2 by means of a separate manual control. 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. Access level for the silence control may be configurable, see A.2. Which level is appropriate is be determined by the site requirements for management of the FDAS.

4.4.4.2 The audible indication shall not be silenced automatically.

4.4.4.3 Silencing the audible indication may be accompanied by changes in the visual indications of fire alarm (e.g. the indication of light emitting indicators may change from flashing to steady or the information given on the alphanumeric display may be updated), provided that the conditions are still indicated as required in this document.

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4.4.4.4 The audible indication shall re-sound for each new fire detection zone in alarm. If the option in 4.4.8.1 d) 3) is provided, then a new alarm in the same detection zone shall also re-sound the audible indication.

4.4.5 Other indications during the fire alarm condition

4.4.5.1 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.

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

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, disablements and optionally, test or supervisory modes, 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 4.4.3.2 d) for displaying fire detection zones in alarm and shall display the suppressed indications independently of each other.

c) Fields or the alarm window, may be temporarily suppressed to permit the display of faults, disablements and optionally, test or supervisory modes, however, the display shall meet the requirements of 4.4.3.2 a), 4.4.3.2 b) and 4.4.3.2 c) within 30 s of the suppression.

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4.4.6 Reset from fire alarm condition

4.4.6.1 FDCIE shall be reset from the fire alarm condition at access level 2, by means of a separate manual control, or as specified in 4.6.1.5 or 4.9 (if provided). This control shall be used only for reset and may be the same as that used for reset from the fault warning condition.

ISO 7240-2:2017
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4.4.6.2 Following a reset operation, the correct functional conditions, corresponding to any received signals, shall either remain, or be re-established within 60 s. Reset shall either be completed within 20 s following the manual operation, or where a reset cannot be completed in 20 s, it shall be indicated within 20 s that the reset process is running.

4.4.7 Output of fire alarm condition

4.4.7.1 At least one output that signals the fire alarm condition shall be provided, which may be an output in accordance with 4.4.8, 4.4.9 or 4.4.10.

4.4.7.2 Except where 4.4.11 or 4.4.12 or both apply, FDCIE shall activate all mandatory outputs within 3 s of the indication of a fire alarm condition.

4.4.7.3 Except where 4.4.11 applies, FDCIE shall activate all mandatory outputs within 10 s of the activation of any manual call point.

4.4.8 Output to fire alarm signalling function — Optional function

4.4.8.1 FDCIE shall have provision for the automatic transmission of fire alarm signals to the fire alarm signalling function (see ISO 7240-1:2014, Figure 1, item C). In this case, the following shall apply.

a) It shall be possible to disable fire alarm signalling devices at access level 2.

b) Following disablement, it shall be possible to re-enable fire alarm signalling devices at access level 2.

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c) It shall not be possible to automatically disable fire alarm signalling devices.

d) It shall be possible to configure automatic re-activation of fire alarm signalling devices to at least the following modes:

   1) no automatic re-activation;

   2) automatically re-activate on an alarm from another zone;

   3) automatically re-activate on an alarm from the same zone.

e) Activation of the output to C shall be indicated by means of a separate light emitting indicator, an alphanumeric display, or both. The indication shall be at least common for all such controls, and shall not be suppressed during the fire alarm condition.

4.4.8.2 Where the fire alarm signalling function is not controlled directly from FDCIE, signals may be transferred to the fire alarm control and indication function (see ISO 7240-1:2014, Figure 1, item M).

4.4.9 Control of fire alarm routing function — Optional function

4.4.9.1 Output to fire alarm routing function

FDCIE may have provision for the automatic transmission of fire alarm signals to the fire alarm routing function (see ISO 7240-1:2014, Figure 1, item E). The transmission of the signal may be indicated by means of a separate red 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.

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4.4.9.2 Input from fire alarm routing function

ISO 7240-2:2017
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Where the output specified in 4.4.9.1 is provided, FDCIE may have an input which is capable of receiving signals from the fire alarm routing function (see ISO 7240-1:2014). In this case, the reception of the signals shall be indicated by means of a separate red 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 4.4.9.1. The indication shall remain until the fire alarm condition is reset.

4.4.10 Output to fire protection control function — Optional function

4.4.10.1 Output type A

FDCIE may have provision for the transmission of fire alarm signals to the fire protection control function (see ISO 7240-1:2014, Figure 1, item G).

4.4.10.2 Output type B

FDCIE may have provision for the transmission of fire alarm signals to the fire protection control function (see ISO 7240-1:2014, Figure 1, item G). In this case, the transmission of the signal shall be indicated by means of a separate red light-emitting indicator or a field on the alphanumeric display or both. The indication shall be at least common to all such function, and shall not be suppressed during the fire alarm condition.

4.4.10.3 Output type C

4.4.10.3.1 FDCIE may have provision for the transmission of fire alarm signals to the fire protection control function (see ISO 7240-1:2014, Figure 1, item G). In this case, the reception of a confirmatory signal from such function shall be indicated by means of a separate red light-emitting indicator or a field on the alphanumeric display or both. The indication shall be at least common to all such functions, and shall not be suppressed during the fire alarm condition.

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4.4.10.3.2 The indicator for type C may be the same indicator used for type B, provided that the indication status is clearly discernible (e.g. the use of a flashing indication for type B and a steady-state indication for type C).

4.4.11 Delays to outputs — Optional function

4.4.11.1 Configuration of delays

FDCIE may have provision to delay the activation of outputs to the fire alarm signalling function (see ISO 7240-1:2014, Figure 1, item C) or to fire alarm routing function (see ISO 7240-1:2014, Figure 1, item E) or to the fire protection control function (see ISO 7240-1:2014, Figure 1, item G), or all these (see Annex D). In these cases, at least the following shall apply.

a) The operation of delays to outputs to the fire alarm signalling function or outputs to the fire protection control function shall be selectable at access level 3 to apply to

   — fire detectors, and/or

   — manual call points, and/or

   — signals from individual fire detection zones.

b) The operation of delays to signals to fire alarm routing function shall be selectable at access level 3, to apply to

   — fire detectors, and/or

   — signals from individual fire detection zones.

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c) The delay times shall be configurable at access level 3, in increments not exceeding 1 min, up to a maximum of 10 min.

ISO 7240-2:2017
https://standards.iteh.ai/catalog/standards/sist/8670b90d-5bed-4b80-9e6a-

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.

e) The delay to one output signal shall not affect the activation of other outputs.

f) The activation of the delay shall be indicated by a separate yellow light-emitting indicator or a field on the alphanumeric display, or both.

4.4.11.2 Control of delay

If the configuration is according to 4.4.11.1, FDCIE 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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