
**Fire detection and alarm systems —
Part 28:
Fire protection control equipment**

Systèmes de détection et d'alarme d'incendie —

*Partie 28: Équipement de commande des systèmes de lutte contre
l'incendie*

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Published in Switzerland

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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).

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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 fire fighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

This second edition cancels and replaces the first edition (ISO 7240-28:2008), 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

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Introduction

This part of the ISO 7240 has been prepared by ISO/TC 21, Subcommittee SC 3, the secretariat of which is held by SA and is based on ISO 7240-28:2008.

Fire protection control equipment (FPCE) (ISO 7240-1:2014, Figure 1, item G) receives signals from control and indicating equipment (ISO 7240-1:2014, Figure 1, item B) and sends initiating signals to automatic fire protection equipment (AFPE) (ISO 7240-1:2014, Figure 1, item H). The initiating signals are used to operate AFPE, such as pumps associated with fire suppression systems, control doors, dampers, fans, and other equipment.

This part of ISO 7240 describes the mandatory functions that it is required on all FPCE covered by this part of ISO 7240, and optional functions with their associated requirements. 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 the FPCE covered by this part of ISO 7240, with different combinations of functions, to conform to the specified requirements. It is necessary that FPCE complying with this part of ISO 7240 fulfil the requirements of all of the mandatory functions, together with the requirements of those optional functions that are provided.

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

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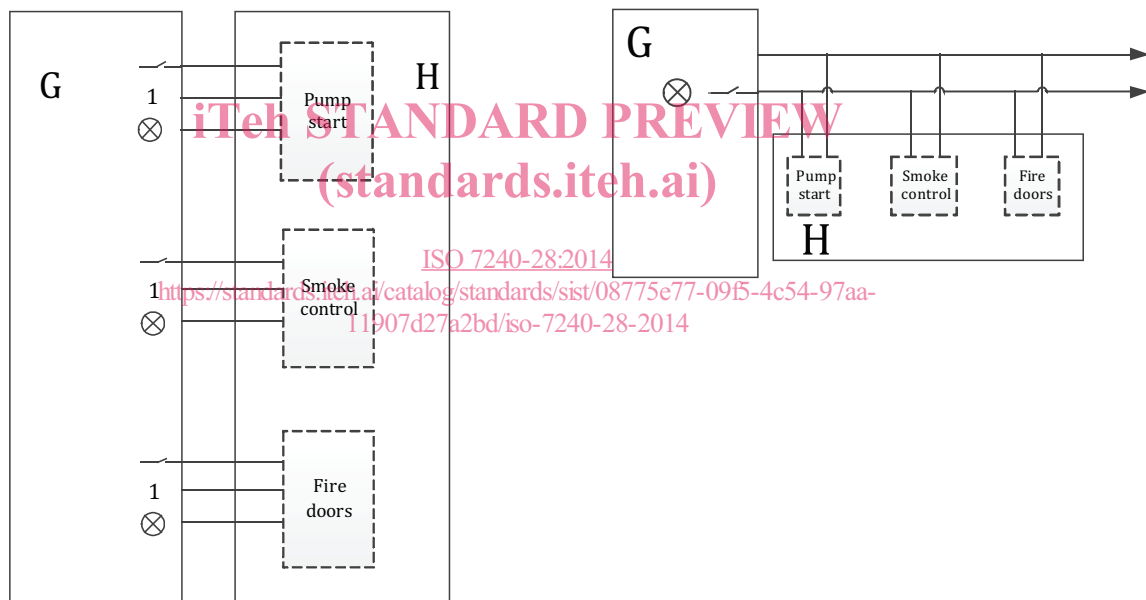
Fire detection and alarm systems —

Part 28: Fire protection control equipment

1 Scope

This part of ISO 7240 specifies requirements, methods of test, and performance criteria for fire protection control equipment (FPCE) (ISO 7240-1:2014, Figure 1, item G) connected to automatic fire protection equipment (AFPE) (ISO 7240-1:2014, Figure 1, item H) installed in buildings.

The FPCE receives signals from fire detection control and indicating equipment (ISO 7240-1:2014, Figure 1, item B), sends control signals to, and indicates the condition of, the AFPE (see Figure 1). The control signals are used to initiate automatic fire protection equipment, such as pumps associated with fire suppression systems, control doors, dampers, fans, and the like.



a) FPCE with discrete transmission paths

b) FPCE with serial transmission path

Key

- G fire protection control equipment
- H automatic fire protection equipment
- 1 automatic control
- ⊗ indicator
- manual control

Figure 1 — Typical fire protection control equipment configuration

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 7240-2, *Fire detection and alarm systems — Part 2: Control and indicating equipment*

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

ISO 7240-13, *Fire detection and alarm systems — Part 13: Compatibility assessment of system components*

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

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

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

IEC 60068-2-47, *Environmental testing — Part 2-47: Tests — Mounting of specimens for vibration, impact and similar dynamic tests*

IEC 60068-2-75, *Environmental testing — Part 2-75: 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 3-3: Classification of groups of environmental parameters and their severities — Stationary use at weatherprotected locations*

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

3 Terms, abbreviated terms, and definitions

3.1 Definitions

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

3.1.1

functional condition

condition of the FPCE characterized by its indication at the FPCE

Note 1 to entry: The functional conditions recognized in this part of ISO 7240 are the following:

- quiescent condition, specified in [4.2](#);
- fire protection condition, specified [4.3](#);
- fault warning condition, specified in [4.4](#);
- disabled condition, specified in [4.5](#);
- test condition, specified [4.6](#).

3.2 Abbreviated terms

AFPE	automatic fire protection equipment
FPCE	fire protection control equipment

4 Requirements

4.1 General

4.1.1 The FPCE shall be capable of unambiguously controlling and indicating the following functional conditions, as described in 4.2 to 4.6:

- quiescent condition;
- fire protection condition;
- fault warning condition;
- disabled condition;
- test condition.

4.1.2 The FPCE shall be capable of functioning simultaneously in any combination of the following functional conditions:

- fire protection condition;
- fault warning condition;
- disabled condition;
- test condition.

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

4.1.4 If an optional function is included in the FPCE, then all the corresponding requirements shall be met.

4.1.5 Functions required in this part of ISO 7240 can be performed within fire detection control and indicating equipment complying with ISO 7240-2.

4.2 Quiescent condition

The FPCE shall be in the quiescent condition when the FPCE is powered, and no other functional condition is indicated. Any kind of system information can be displayed during the quiescent condition. However, no indications shall be given that can be confused with the

- fire protection condition,
- fault warning condition,
- disabled condition, or
- test condition.

4.3 Fire protection condition

4.3.1 Reception and processing of fire protection condition signals

4.3.1.1 The FPCE shall receive fire alarm condition signals from fire detection control and indicating equipment (ISO 7240-1:2014, Figure 1, item B), and within 3 s, send signals as configured to initiate AFPE.

4.3.1.2 Fire alarm condition signals shall be latched by the FPCE until reset.

4.3.1.3 FPCE output signals shall be activated as part of the fire protection condition.

4.3.1.4 FPCE output signals shall be configurable at access level 3. The configuration, at least, shall be dependent upon the fire alarm condition signals received from the fire detection control and indicating equipment, and shall allow for adaptations that can be required as part of the design of the fire detection and alarm system installed in or around the building.

4.3.1.5 The mandatory indications and/or outputs shall not be falsified by multiple fire signals received from the same or different fire detection control and indicating equipment, resulting from the simultaneous operation of two sets of fire detection control and indicating equipment, and/or the operation of additional sets of fire detection control and indicating equipment.

4.3.2 Indication of the fire protection condition

4.3.2.1 Indication of the fire protection condition is established when the following are present:

- a) a visible indication, by means of a separate light-emitting indicator (the general fire protection condition indicator); <https://standards.iteh.ai/catalog/standards/sist/08775e77-09f5-4c54-97aa-11907d27a2bd/iso-7240-28-2014>
- b) a visible indication of the FPCE output activation, as specified in [4.3.3](#), which can be omitted for FPCE and capable of sending signals to only one AFPE;
- c) an audible indication, as specified in [4.10](#).

4.3.2.2 The time taken for processing signals within the FPCE shall not delay the indication of the fire protection condition at the FPCE by more than 3 s.

4.3.2.3 The display of the fire protection condition shall take priority over the display of other conditions.

4.3.3 Automatic fire protection equipment

4.3.3.1 Activation by fire protection control equipment

4.3.3.1.1 Activation of the FPCE output shall be indicated by means of a separate light-emitting indicator, or a field of an alphanumeric display, or both, for each FPCE output.

4.3.3.1.2 Where an alphanumeric display is used and separate light-emitting indicators for each FPCE output are not provided, a separate light-emitting indicator (the general output indicator) is also required.

4.3.3.1.3 The output indicators shall be separate and distinct from the fire protection condition indicator.

4.3.3.1.4 If the indications are on an alphanumeric display that, because of its limited capacity, cannot simultaneously indicate all activated equipment, at least the following shall apply:

- a) The total number of FPCE outputs activated shall be displayed until the FPCE has been reset.
- b) Activated FPCE outputs 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 output information. When the last activated output is displayed, activation of the manual control shall cause the first output in the list to be re-displayed.
- c) The indication shall not be suppressed by indications of other functional conditions.

4.3.3.1.5 The FPCE output indicator shall flash when the FPCE output is activated and go steady when the FPCE receives acknowledgement from the AFPE.

NOTE 1 The criteria used for the acknowledgement signal are dependent on the AFPE. For example, an acknowledgement signal for a smoke exhaust fan might not be sent from the exhaust fan control equipment until the fan has correctly started.

NOTE 2 Some activated equipment (e.g. valves for a gas cylinder) might not be capable of sending an acknowledgement signal. In this example, the output indicator remains flashing, indicating to the operator that the status of the AFPE remains unclear.

4.3.3.2 Activation by means other than by the fire protection control equipment

4.3.3.2.1 Activation of the AFPE by means other than the FPCE (e.g. a suppression system directly activated by heat) shall be indicated by separate light-emitting indicators, or an alphanumeric display, or both, for each FPCE output. The indicators can be the same as those used in [4.3.3.1](#).

4.3.3.2.2 When the AFPE is activated by means other than the FPCE, the FPCE output visual indicator shall go steady and the audible indication, as specified in [4.10](#), shall activate.

NOTE If the AFPE is activated by means other than the FPCE, the activation is not considered as a fire protection condition; therefore, the reset function of [4.3.4.4](#) does not apply.

4.3.3.2.3 The audible indication shall not be silenced automatically.

4.3.3.2.4 If previously silenced, the audible indication shall re-sound for each new FPCE output activation.

4.3.4 Manual controls

4.3.4.1 General

4.3.4.1.1 Manual controls shall be available at access level 2 to activate and deactivate the outputs of the FPCE.

4.3.4.1.2 The time taken for processing manual control signals within the FPCE shall not delay the output activation at the FPCE by more than 3 s. Where more than one output is activated by a single manual control, the activation of each subsequent output can be delayed by not more than 3 s per output.

4.3.4.1.3 When operated, a manual control shall suspend the programmed operation of the associated FPCE output. When the manual control is no longer in use, the programmed operation of the FPCE output shall resume from the point of suspension.

NOTE The resumption of programmed operation might need to include a re-examination of any active FPCE input signals.

4.3.4.2 Indication of the activation of a manual control

4.3.4.2.1 Activation of the manual control shall be indicated by means of a separate light-emitting indicator, or an alphanumeric display, or both, for each FPCE output. The indicator shall be cancelled when the manual control is deactivated.

4.3.4.2.2 The activation of the manual control shall be indicated within 2 s of the completion of the manual operation.

4.3.4.3 Other indications

If fault warning conditions, disabled conditions, or test conditions are indicated by means of separate light-emitting indicators, and such indications are suppressed in the manual control condition, it shall be possible to reveal these by means of a manual operation at access level 1 or access level 2.

4.3.4.4 Reset

4.3.4.4.1 A manual control shall be provided to reset the FPCE from the fire protection condition at access level 2.

4.3.4.4.2 Indications of the fire protection condition shall be reset manually (see [4.3.4.4.1](#)) and can be reset automatically when the fire alarm condition is reset at the fire detection control and indicating equipment.

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

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4.4 Fault warning condition
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4.4.1 Reception and processing of fault warning signals

4.4.1.1 The FPCE shall enter the fault warning condition when signals are received that, after necessary processing, are interpreted as fault.

4.4.1.2 The FPCE shall be capable of simultaneously recognizing all of the faults specified in [4.4.3.1](#) and [4.4.3.4](#), unless this is prevented by

- the presence of a fire protection condition from the same input, and/or
- the disablement of the corresponding input or output, and/or
- the testing of a corresponding input or output.

4.4.1.3 Faults specified in [4.4.3.1](#) and [4.4.3.4](#) shall be indicated without prior manual intervention, unless the FPCE is in the fire protection condition, in which case, the fault indications can be suppressed.

4.4.2 Indication of the fault warning condition

4.4.2.1 The fault warning condition is established when all of the following are present:

- a) a visible indication by means of a separate light-emitting indicator (the general fault warning indicator);
- b) a visible indication for each fault, specified in [4.4.3.1](#);