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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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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.

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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.

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ISO 7240-28 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*:

— *Part 1: General and definitions*

— *Part 2: Control and indicating equipment*

— *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: 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 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 19: Design, installation, commissioning and service of sound systems for emergency purposes*

— *Part 21: Routing equipment*

— *Part 22: Smoke-detection equipment for ducts*

— *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*

A Part 17 dealing with short circuit isolators, a Part 18 dealing with input/output devices, a Part 20 dealing with aspirating smoke detectors, Parts 24 and 25 dealing with components using radio links and a Part 26 dealing with oil mist detectors are under development.

Introduction

This part of the ISO 7240 has been prepared by ISO/TC 21, Subcommittee SC 3, and is based on a draft prepared by the 6th Subcommittee of the Chinese National Technical Committee for Fire Protection Standardization.

Fire protection control equipment (f.p.c.e.) (item G in Figure 1 of ISO 7240-1:2005) receives signals from control and indicating equipment (item B in Figure 1 of ISO 7240-1:2005) and sends initiating signals to automatic fire protection equipment (a.f.p.e.) (item H in Figure 1 of ISO 7240-1:2005). The initiating signals are used to operate automatic fire protection equipment, 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 to provide on all f.p.c.e. 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 f.p.c.e. covered by this part of ISO 7240, with different combinations of functions, to conform to the specified requirements. It is necessary that f.p.c.e. 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.

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 (f.p.c.e.) (ISO 7240-1:2005, Figure 1, item G) connected to automatic fire protection equipment (a.f.p.e.) (ISO 7240-1:2005, Figure 1, item H) installed in buildings.

The f.p.c.e. receives signals from control and indicating equipment (ISO 7240-1:2005, Figure 1, item B), sends control signals to, and indicates the condition of, the a.f.p.e. 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.

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 7240-1:2005, *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 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-3:2002, *Classification of environmental conditions — Part 3-3: Classifications of groups of environmental parameters and their severities — Stationary use at 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, 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
alarm zone
geographical subdivision of the protected premises for which a common zonal indication is provided

NOTE One alarm zone may consist of several floors or fire compartments.

3.1.2
functional condition
condition of the f.p.c.e. characterized by its indication at the f.p.c.e.

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

— quiescent condition specified in Clause 6;

— fire protection condition specified in Clause 7;

— fault warning condition specified in Clause 8;

— disabled condition specified in Clause 9;

— test condition specified in Clause 10.

3.1.3
indication
information given by an indicator

3.2 Abbreviated terms

— a.f.p.e. automatic fire protection equipment

— f.p.c.e. fire protection control equipment

4 General requirements

4.1 Functions

4.1.1 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.

4.1.2 If an optional function is included in the f.p.c.e., then all the corresponding requirements shall be met.

4.1.3 Functions required in this part of ISO 7240 may be performed within control and indicating equipment complying with ISO 7240-2.

4.2 Power supply

The power supply for the f.p.c.e. shall comply with the requirements of ISO 7240-4. Where the f.p.c.e. is included within the control and indicating equipment cabinet, both sets of equipment may share the same power supply.

5 General requirements for indications

5.1 Display of functional conditions

5.1.1 The f.p.c.e. shall be capable of unambiguously indicating the following functional conditions, as described in Clauses 6 to 10:

— quiescent condition;

— fire-protection condition;

— fault-warning condition;

— disablement condition;

— test condition.

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

— fire-protection condition;

— fault-warning condition;

— disablement condition;

— test condition.

5.2 Display of indications

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

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

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 are grouped.

5.4 Indication of the supply of power

A visible indication shall be given by means of a separate light-emitting indicator while the f.p.c.e. is supplied with power. Where the f.p.c.e. is integrated with the control and indicating equipment, a single power-supply indication may be used for both sets of equipment.

5.5 Audible indications

The audible indication for the fault-warning condition may be the same as that for the fire-protection condition. If they are different, the fire-protection condition 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

The f.p.c.e. shall be in the quiescent condition when the f.p.c.e. is powered and no other functional condition is indicated. Any kind of system information may 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;

— test condition.

7 Fire protection condition

7.1 Reception and processing of fire-protection condition signals

7.1.1 The f.p.c.e. shall receive fire-alarm condition signals from control and indicating equipment (ISO 7240-1:2005, Figure 1, item B) and within 3 s send signals, as configured, to initiate a.f.p.e.

7.1.2 Fire-alarm condition signals shall be latched by the f.p.c.e. until reset.

7.1.3 The f.p.c.e. shall display the alarm zone in which the fire alarm occurred.

Where the f.p.c.e. is integrated with the control and indicating equipment, the alarm zone may be displayed on the control and indicating equipment.

7.1.4 The output signals from the f.p.c.e shall be configurable, depending on the input signals, at access level 3.

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

7.2 Indication of the fire-protection condition

7.2.1 Indication of the fire-protection condition is established when both of the following are present:

a) a visible indication, by means of a separate light-emitting indicator (the general fire-protection condition indicator);

b) a visible indication, as specified in 7.3, of the f.p.c.e. output activation, which may be omitted for f.p.c.e. capable of sending signals to only one a.f.p.e.

7.2.2 The time taken for processing signals within the f.p.c.e. shall not delay the indication of the fire-protection condition at the f.p.c.e. by more than 3 s.

7.3 Automatic fire-protection equipment

7.3.1 Activation by fire-protection control equipment

7.3.1.1 Activation of the f.p.c.e. output shall be indicated by means of a separate light-emitting indicator, or an alphanumeric display, or both, for each f.p.c.e. output.

Where an alphanumeric display is the only indicator, a separate light-emitting indicator (the general output indicator) is also required.

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

7.3.1.3 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 f.p.c.e. outputs activated shall be displayed until the f.p.c.e. has been reset.

b) Activated f.p.c.e. 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.

7.3.1.4 The f.p.c.e. output indicator shall flash when the f.p.c.e. output is activated and go steady when the f.p.c.e. receives acknowledgement from the a.f.p.e.

NOTE 1 The criteria used for the acknowledgement signal are dependent on the a.f.p.e. 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 a.f.p.e. remains unclear.

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

7.3.2.1 Activation of the a.f.p.e. by means other than the f.p.c.e. (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 f.p.c.e. output. The indicators may be the same as those used in 7.3.1.

7.3.2.2 When the a.f.p.e. is activated by means other than by the f.p.c.e., the f.p.c.e. output visual indicator shall go steady and the audible indication, as specified in 12.10, shall activate.

NOTE If the a.f.p.e. is activated by means other than the f.p.c.e., the activation is not considered as a fire protection condition; therefore, the reset function of 7.5 does not apply.

7.3.2.3 The audible indication shall not be silenced automatically.

7.3.2.4 If previously silenced, the audible indication shall re-sound for each new f.p.c.e. output in alarm.

7.4 Other indications during the fire protection condition

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

7.5 Reset from the fire-protection condition

7.5.1 Indications of the fire-protection condition shall be reset manually (see 7.6.4) and may be reset automatically when the fire alarm condition is reset at the control and indicating equipment.

7.5.2 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.

7.6 Manual controls

7.6.1 General

7.6.1.1 Manual controls shall be available at access level 2 to activate and deactivate the outputs of the f.p.c.e.

7.6.1.2 The time taken for processing manual control signals within the f.p.c.e. shall not delay the output activation at the f.p.c.e. by more than 3 s. Where more than one output is activated by a single manual control, the activation of each subsequent output may be delayed by not more than 3 s per output.

7.6.1.3 Manual controls shall suspend and take priority over automatic or programmed operation of the f.p.c.e. outputs.

7.6.2 Indication of the activation of a manual control

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

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

7.6.3 Other indications

If fault-warning conditions, disablement 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 possible to reveal these by means of a manual operation at access level 1.

7.6.4 Reset

A manual control shall be provided to reset the f.p.c.e. from the fire-protection condition.

8 Fault warning condition

8.1 Reception and processing of fault warning signals

8.1.1 The f.p.c.e. shall enter the fault-warning condition when signals are received that, after necessary processing, are interpreted as a fault.

8.1.2 The f.p.c.e. shall be capable of simultaneously recognizing all of the faults specified in 8.3.1 and 8.3.4 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.

8.1.3 The presence of faults specified in 8.3.1 and 8.3.4 shall be indicated without prior manual intervention.