INTERNATIONAL STANDARD

ISO 7240-21

First edition
2005-07-01

Fire detection and alarm systems —

Part 21: Routing equipment

Systèmes de détection et d'alarme d'incendie —

Partie 21: Équipement de transmission

Reference number
ISO 7240-21:2005(E)

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Published in Switzerland

Contents

Page

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 7240-21 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 11: Manual call points*

— *Part 12: Line type smoke detectors using a transmitting light 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: Multisensor fire detectors*

— *Part 21: Routing equipment*

— *Part 22: Duct sampling equipment*

The following part is under preparation:

— *Part 9: Test fire for fire detectors* [Technical Report]

Introduction

This part of ISO 7240 combines the requirements for both fire-alarm routing (transmitting) equipment (ISO 7240-1:—, Figure 1, item E) and fault (trouble) warning routing equipment (ISO 7240-1:—, Figure 1, item J) into a single equipment Standard.

Routing equipment receives signals from control and indicating equipment (ISO 7240-1:—, Figure 1, item B) and sends fire alarm signals to a fire-alarm receiving station (ISO 7240-1, Figure 1, item F) and fault signals to a fault warning (trouble signal) receiving station (ISO 7240-1, Figure 1, item K). The receiving stations may be in the same or different locations.

This part of ISO 7240 describes the mandatory functions which are required to be provided on all routing equipment covered by this part of ISO 7240, and optional functions with their associated requirements. It is intended that the options will 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 routing equipment covered by this document with different combinations of functions to conform to this part of ISO 7240. Routing equipment complying with this part of ISO 7240 will need to fulfil the requirements of all of the mandatory functions, together with the requirements of those optional functions which are provided.

Fire detection and alarm systems —

Part 21: Routing equipment

1 Scope

This part of ISO 7240 specifies requirements, methods of test, and performance criteria for fire-alarm routing (transmitting) equipment (ISO 7240-1:—, Figure 1, item E) and for fault (trouble) warning routing equipment (ISO 7240-1:—, Figure 1, item J) 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:—[1)], *Fire detection and alarm systems — Part 1: General and definitions*

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

IEC 60068-1:1990-05, *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 2-47: Test methods — Mounting of components, equipment and other articles 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 60529:2001-02, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-3:2002-10, *Classification of environmental conditions — Part 3-3: Classifications of groups of environmental parameters and their severities — Stationary use and weatherprotected locations*

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

1) To be published.

3 Definitions

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

3.1
access level
one of several states of a routing equipment in which selected

— controls can be operated;

— manual operations can be carried out;

— indications are visible, and/or;

— information can be obtained.

NOTE See Annex A.

3.2
field
sub-division of a window

3.3
functional condition
condition of the routing equipment characterized by its indication at the routing equipment

NOTE The functional conditions recognized in this part of the 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 routing equipment is powered by a power supply conforming to ISO 7240-4 and no other functional condition is indicated.

3.4
indicator
device which can change its state to give information

3.5
indication
information given by an indicator

3.6
mandatory
⟨adjective⟩ qualification applied to those functions required to be provided on all routing equipment and the functions' requirements and to the requirements of any optional functions that have requirements, if such optional functions are provided

3.7
non-volatile memory
memory elements which do not require the presence of an energy source for the retention of their contents

3.8
point
component connected to a detection circuit enabling the transmission or reception of information in relation to fire detection

NOTE Includes ISO 7240-1:–, Figure 1, items A and D.

3.9
program
software necessary for routing equipment to comply with at least the requirements of this part of ISO 7240, including initializing data, reset and interrupt vectors, operating code, and declarations

3.10
reset
operation capable of terminating the fire alarm condition and/or the fault warning condition

3.11
running data
alterable data subject to temporary modification during operation, either automatically or by manual controls

3.12
separate
⟨adjective⟩ physically separate and exclusively provided for the purpose or purposes stated in this part of ISO 7240

3.13
silencing
⟨noun⟩ manual operation for switching off the audible signal of a sounding device that is capable of being automatically re-sounded by a new event

3.14
transmission path
connection, external to the cabinet of the routing equipment, for the transmission of information and/or power

— between the routing equipment and other components of a fire detection and fire alarm system as defined in ISO 7240-1, and/or

— between parts of routing equipment contained in different cabinets

3.15
volatile memory
memory elements which require the presence of an energy source for the retention of their contents

3.16
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 might be realized either by mechanical separation, or under software control.

3.17
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

4 General requirements

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

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

5 General requirements for indications

5.1 Display of functional conditions

5.1.1 The routing equipment shall be capable of unambiguously indicating the following functional conditions, as described in Clauses 6 to 11:

— quiescent condition;

— fire alarm condition;

— supervisory signal condition;

— fault warning condition;

— disabled condition;

— test condition.

5.1.2 The routing equipment shall be capable of being simultaneously, in any combination of the following functional conditions:

— fire alarm condition;

— supervisory signal condition;

— fault warning condition;

— disabled 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 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 routing equipment is supplied with power.

5.5 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 control-and-indicating equipment indications used in the

— fire alarm condition,

— supervisory signal condition,

— fault warning condition,

— disabled condition,

— test condition.

7 Fire alarm condition

7.1 Reception and processing of fire signals

7.1.1 The routing equipment shall report the fire alarm condition to the fire alarm receiving station (ISO 7240-1:—, Figure 1, item F) when fire alarm signals are received from the control-and-indicating equipment.

7.1.2 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 control-and-indicating equipment and/or the operation of further control-and-indicating equipment.

7.2 Indication of the fire alarm condition

7.2.1 The fire alarm condition shall be indicated when the routing equipment receives the fire alarm signal from the control-and-indicating equipment.

7.2.2 The time taken for processing of signals from control-and-indicating equipment shall not delay the indication of the fire alarm condition at the routing equipment by more than 60 s.

7.2.3 The signal may be indicated by means of a separate light-emitting indicator and/or a field on the alphanumeric display.

7.2.4 The indicator shall flash when the condition is received by the routing equipment and go steady when the routing equipment receives acknowledgement from the receiving station that the signal has been correctly received.

7.3 Other indications during the fire alarm condition

If supervisory conditions 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.

7.4 Reset from the fire alarm condition

7.4.1 The routing equipment shall reset from reporting and displaying the fire alarm condition when the fire alarm condition is reset at the control-and-indicating equipment. Reset from the fire alarm condition shall not require any manual intervention.

7.4.2 Following a reset, the indication of the correct functional conditions, corresponding to any received signals, shall either remain, or be re-established within 60 s.

8 Supervisory signal condition

8.1 Reception and processing of supervisory signals

8.1.1 The routing equipment shall report the supervisory condition to the fault warning (trouble signal) receiving station (ISO 7240-1:—, Figure 1, item K) when supervisory signals are received from the control-and-indicating equipment.

8.1.2 The mandatory indications and/or outputs shall not be falsified by multiple supervisory signals received from the same or different control-and-indicating equipment, resulting from the simultaneous operation of two control-and-indicating equipment and/or the operation of further control-and-indicating equipment.

8.2 Indication of the supervisory alarm condition

8.2.1 The supervisory condition shall be indicated when the routing equipment receives the supervisory alarm signal from the control-and-indicating equipment.

8.2.2 The time taken for processing of signals from control-and-indicating equipment shall not delay the indication of the supervisory condition at the routing equipment by more than 60 s.

8.2.3 The signal may be indicated by means of a separate light-emitting indicator and/or a field on the alphanumeric display.

8.2.4 The indicator shall flash when the condition is received by the routing equipment and go steady when the routing equipment receives acknowledgement from the receiving station that the signal has been correctly received.

8.3 Supervisory indications during the supervisory condition

If supervisory signals 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.

8.4 Reset of supervisory signal

8.4.1 The routing equipment shall reset from reporting and displaying the supervisory condition when the supervisory condition is reset at the control-and-indicating equipment. Reset from the supervisory condition shall not require any manual intervention.

8.4.2 Following a reset operation, the indication of the correct functional conditions, corresponding to any received signals, shall either remain, or be re-established within 60 s.

9 Fault warning condition

9.1 Reception and processing of fault warning signals

9.1.1 The routing equipment shall report the fault warning condition to the fault warning (trouble signal) receiving station (ISO 7240-1:—, Figure 1, item K) when fault warning signals are received from the control-and-indicating equipment.

9.1.2 The mandatory indications and/or outputs shall not be falsified by multiple fault warning signals received from the same or different control-and-indicating equipment, resulting from the simultaneous operation of two control-and-indicating equipment and/or the operation of further control-and-indicating equipments.