



BSI Standards Publication

Code of practice for the operation of fire protection measures

Part 6: Fire detection and fire alarm systems – Interface with ancillary systems and equipment

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Summary of pages

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Foreword

Publishing information

This part of BS 7273 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 August 2019. It was prepared by Subcommittee FSH/12/4, *Automatic operation of fire protection*, under the authority of Technical Committee FSH/12, *Fire detection and alarm systems*. A list of organizations represented on these committee can be obtained on request to their secretary.

Relationship with other publications

BS 7273 is published in six parts:

- Part 1: *Electrical actuation of gaseous total flooding extinguishing systems*;
- Part 2: *Mechanical actuation of gaseous total flooding and local application extinguishing systems*;
- Part 3: *Electrical actuation of pre-action watermist and sprinkler systems*;
- Part 4: *Actuation of release mechanisms for doors*;
- Part 5: *Electrical actuation of watermist systems (except pre-action systems)*;
- Part 6: *Fire detection and fire alarm systems – Interface with ancillary systems and equipment*.

Information about this document

This is a new part of the BS 7273 series.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

As a code of practice, this part of BS 7273 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this part of BS 7273 is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this part of BS 7273 that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Competence of organizations involved in the design and installation of ancillary systems and equipment can be assured by the use of organizations that are third-party certificated, by a UKAS-accredited certification body, to carry out such activities.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

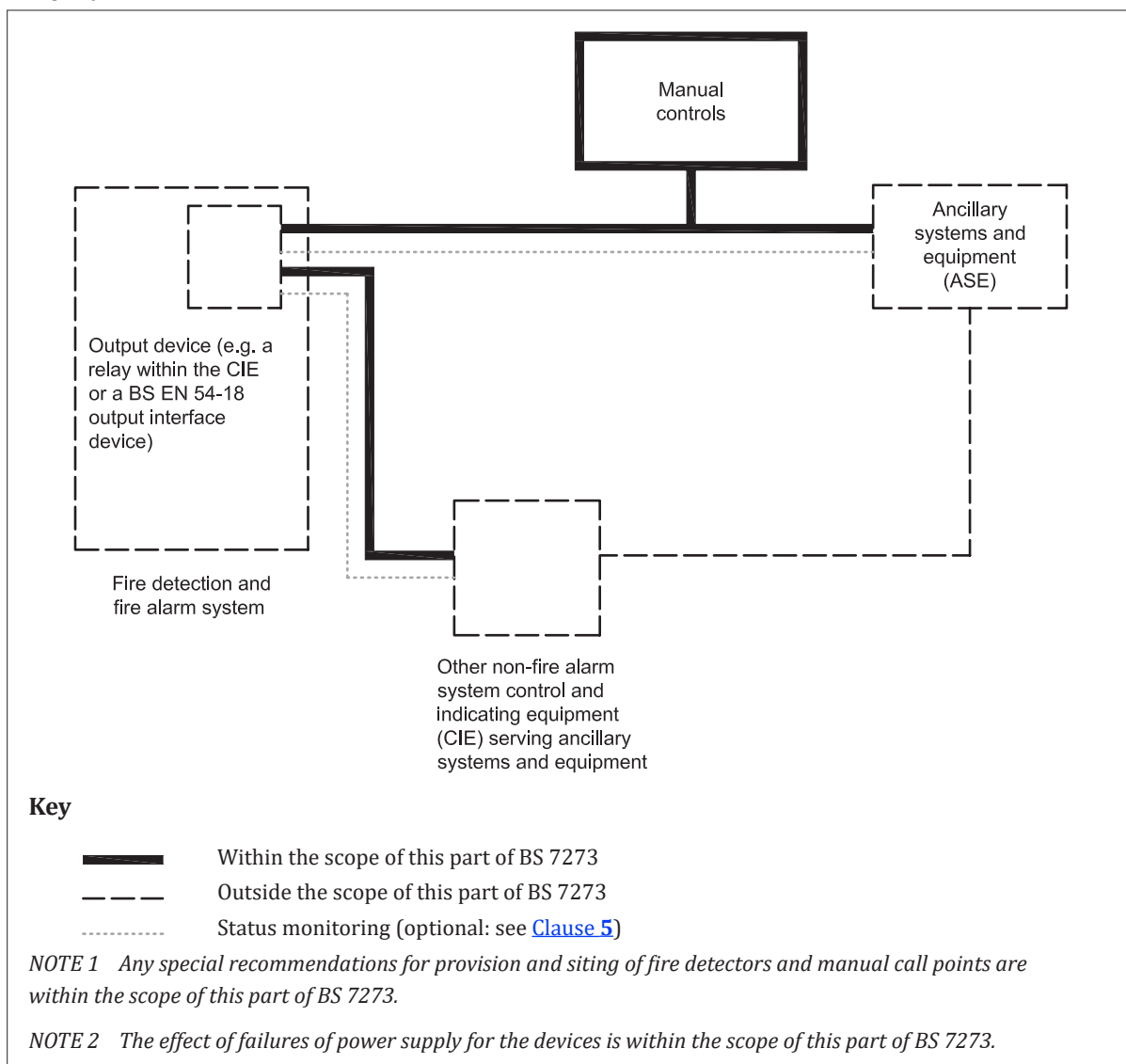
This part of BS 7273 gives recommendations for the design, installation, commissioning and maintenance of interface arrangements between fire detection and fire alarm systems conforming to BS 5839-1:2017 and various ancillary systems and equipment (ASE), where this interface is required by the fire strategy for a building, excluding the interface with those systems covered in other parts of the BS 7273 series.

Arrangements covered by this part of BS 7273 include the interface between fire detection and fire alarm systems and:

- smoke control systems;
- lifts and other lifting appliances;
- gas valves;
- fire-resisting shutters and active fire curtain barrier assemblies;
- electricity supplies;
- ventilation systems;
- lighting, intelligent signage and wayfinding; and
- paging systems.

This part of BS 7273 does not apply to the interface between ASE contained solely within a private dwelling and the fire detection and fire alarm system within that dwelling. It applies to systems installed in the common parts of blocks of flats (e.g. activation of the smoke control system), and where the actuation of the detection within a dwelling is intended to interact with a system within common parts (such as in sheltered housing).

The scope of this part of BS 7273 is shown diagrammatically in [Figure 1](#).

Figure 1 — Scope of BS 7273-6

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document¹. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 5266-1](#), *Emergency lighting — Part 1: Code of practice for the emergency lighting of premises*

[BS 5839-1:2017](#), *Fire detection and fire alarm systems for buildings — Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*

[BS 6724](#), *Electric cables — Thermosetting insulated, armoured cables of rated voltages of 600/1 000 V and 1 900/3 300 V for fixed installations, having low emission of smoke and corrosive gases when affected by fire — Specification*

[BS 7346-8](#), *Components for smoke control systems — Part 8: Code of practice for planning, design, installation, commissioning and maintenance*

BS 7671, *Requirements for Electrical Installations — IET Wiring Regulations*

¹ Documents that are referred to solely in an informative manner are listed in the Bibliography.

[BS 7846](#), *Electric cables — Thermosetting insulated, armoured, fire-resistant cables of rated voltage 600/1 000 V for fixed installations, having low emission of smoke and corrosive gases when affected by fire — Specification*

[BS 9999](#), *Fire safety in the design, management and use of buildings — Code of practice*²

BS EN 54-4, *Fire detection and fire alarm systems — Part 4: Power supply equipment*

BS EN 1838, *Lighting applications — Emergency lighting*

BS EN 12101 (all parts), *Smoke and heat control systems*

BS EN 50172 (BS 5266-8), *Emergency escape lighting systems*

BS EN 60702-1, *Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V — Part 1: Cables*

ETSI EN 300 220-1, *Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz — Part 1: Technical characteristics and methods of measurement*

ETSI EN 300 220-2, *Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz — Part 2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU for non-specific radio equipment*

ETSI EN 300 224, *Land Mobile Service — Radio equipment for use in a paging service operating within the frequency range 25 MHz – 470 MHz — Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

3 Terms and definitions

For the purposes of this part of BS 7273, the following terms and definitions apply.

3.1 cause and effect

relationship between one or more events

NOTE The “cause” gives rise to, or triggers, one or more other events, and the “effect” is the consequence of those events.

3.2 circuit

assembly of components supplied from a single source and protected against overcurrent by the same protective device(s) or current limitation arrangements

3.3 coincidence

arrangement designed such that an output is obtained only when at least two independent input triggering signals are present at the same time

NOTE For example, an output suitable for triggering ASE is obtained only after a detector has detected a fire, and at least one other independent detector covering the same protected space has confirmed the existence of fire.

3.4 commissioning

process by which it is determined that the installed system meets the appropriate requirements

² This part of BS 7273 gives informative references to BS 9999:2017.

3.5 competent person

person with the relevant current training and experience, and with access to the requisite tools, equipment and information, and capable of carrying out a defined task

[SOURCE: BS 5839-1:2017, 3.12]

3.6 control and indicating equipment (CIE)

component(s) of a fire detection and fire alarm system through which other components are supplied with power

3.7 critical signal path

all interconnections and communications between a fire detection and fire alarm system and the input terminals on or within ASE, or between CIE and other control equipment by which ASE is controlled (see [Figure 1](#))

3.8 fail-safe

designed such that specified failures result in the same action as a fire signal

3.9 fire signal

signal intended to indicate the occurrence of a fire

3.10 fire strategy

set of fire safety objectives and the measures to be taken to meet those objectives

3.11 installer

person or organization having responsibility for all or part of the process of installing the measures to which this standard relates

3.12 maintenance

work of inspection, servicing and repair necessary in order to maintain the efficient operation of the measures to which this standard relates

3.13 manual call point

component of a fire detection and fire alarm system that is used for the manual initiation of an alarm

3.14 paging system

system interfaced to the fire alarm CIE to provide automatic transmission of encoded data, usually in the form of alphanumeric messages, to fixed, mobile or portable receiving devices to alert individuals or a group of individuals to a fire or other event

NOTE Although not exclusively, this is normally by radio transmission means to portable pocket receivers, mobile desktop terminals or fixed displays.

3.15 pre-alarm warning

early warning of conditions which might (or might not) represent a fire

3.16 protection

presence of one or more automatic fire detector(s) able to initiate actions needed for the safety of life or property in the event of a fire and for triggering of a change of state in ASE

3.17 radio-actuated system

ASE that is activated wirelessly by means of an encoded radio transmission initiated by a trigger (e.g. a relay output) from the fire detection and fire alarm system CIE, causing a corresponding radio receiver to decode and activate a switched output to the ASE

3.18 servicing

routine process of work on the measures to which this standard relates, carried out at predetermined intervals

3.19 staff alarm

restricted alarm, following the operation of a manual call point or automatic fire detector, given to certain staff in the premises to permit investigation prior to evacuation and/or summoning of the fire and rescue service

3.20 stakeholder

party with an interest in the system

NOTE The interest might be:

- financial, e.g. owner or insurance company;
- as a customer (internal or external);
- as an enforcing authority, e.g. building control body, fire and rescue authority;
- in a professional capacity as an adviser to one of the parties, e.g. architect, fire engineer, building service engineer; or
- in a contractual capacity, e.g. a manufacturer, installer or maintainer of equipment.

4 General recommendations for interface connections

COMMENTARY ON CLAUSE 4

Interfacing is required when a fire detection and fire alarm system is connected to ASE. Common applications for such interfaces are described in [Annex A](#).

It is necessary to ensure that the two systems or equipment do not jeopardize each other through electrical interference or loading effects. The power taken by the other equipment needs to be accounted for by providing sufficient power capacity, providing additional power supplies or ensuring that the interconnection does not allow excessive loading.

It is likely that the ASE will need to be tested regularly to verify that it is operating correctly. There might need to be disablement facilities to prevent the ASE from being operated during regular testing of the fire detection and fire alarm system and test facilities, to allow the organization responsible for the ASE to activate the ASE from the fire detection and fire alarm system at appropriate times of regular servicing.

In some cases, it might not be practicable to test the ASE regularly. In these cases, it might be necessary to be able to confirm connection to the ASE and to confirm that the ASE is capable of operating correctly, e.g. by verifying that the transmission path is fault-free and that the necessary power supplies are operating correctly.

In some cases, it might be necessary to ensure that the interface between the systems is fail-safe, i.e. that in the event of one of the systems failing to be able to operate, the output operates automatically to place the interfaced ASE into a safe state (normally, the same state as initiated by a fire signal).

Some fire detection and fire alarm systems can provide a pre-alarm warning. This warning is primarily intended to enable investigation of conditions that might give rise to a false alarm. It is not normally appropriate, therefore, for a change of state of ASE to be actuated in the event of a pre-alarm warning, unless that is the intended function of the ASE.

Recommendations for electromagnetic compatibility and electrical safety are given in [Clause 17](#), [Clause 18](#) and BS 5839-1:2017, Clause 9.

The following recommendations should be met.

- a) Where it is necessary for the fire detection and fire alarm system to provide power to operate ASE, in the quiescent or the alarm state, the power requirements should be quantified and provision should be made by specifying the appropriate rating for the fire detection and fire alarm system power supply or by providing an ancillary power supply.
- b) When interfacing a fire detection and fire alarm system to ASE, means should be provided to test the respective systems or equipment during regular maintenance.
- c) Where it is not practicable regularly to activate the ASE, the interconnection should be monitored and means should be provided to monitor the ASE to determine whether it is available. Fault indications should be given on the fire detection and fire alarm system if the ASE is disabled, disconnected or powered down, such that it is not able to operate.
- d) Where it is not desired to activate the ASE during regular testing of the fire detection and fire alarm system, means should be provided to disable the interface between the systems. In this case, an indication should be given at the fire alarm CIE to indicate that the interface is disabled.
- e) Where operation of ASE is critical for safety in case of fire, the interface to the ASE should fail in a safe condition, taking into account the cause and effect of the ASE.
- f) The fire strategy for the building should define the circumstances in which a signal should be transmitted from the fire detection and fire alarm system to the ASE.

NOTE In some cases, it might be necessary for a signal to be sent to the ASE on pre-alarm detection before there is a confirmed fire condition.

5 Status monitoring

COMMENTARY ON CLAUSE 5

In the case of certain ASE, it is possible, and might be desirable, for the status of the system to be monitored at the fire detection and fire alarm system CIE. This could include monitoring of the ASE so that a fault in the ASE is indicated at the CIE. In addition, or alternatively, monitoring could include an arrangement whereby the successful change of state of the ASE in response to a signal from the fire detection and fire alarm system is confirmed at the CIE.

Status monitoring is not necessary for compliance with this part of BS 7273. However, a user or designer might wish to incorporate status monitoring (e.g. in a complex building with a fire control room and ASE that is critical to the fire strategy for the building). In addition, status monitoring might be necessary at the control equipment of certain ASE. For example, in the case of a smoke control system, the status of dampers in a smoke shaft is monitored at the control equipment of the smoke control system.

The following recommendations should be met.

- a) Any requirements for status monitoring should be agreed amongst the relevant stakeholders at the design stage of an interface between the fire detection and fire alarm system and ASE (see [Clause 6](#)).

- b) The design of status monitoring should be such that the reliability in transmission to, and receipt of fire signals at, ASE is not reduced by the transmission of any status signal from the ASE to the CIE.

6 Exchange of information and definition of responsibilities

COMMENTARY ON CLAUSE 6

The design of the interface between the fire detection and fire alarm system and the ASE could be undertaken by the supplier, the installer, representatives of the user or purchaser (including consultants), or by a combination of these parties.

The following recommendations should be met.

- a) The designer of the actuation arrangements should ensure that, to the extent appropriate, there is consultation at the design stage with the following stakeholders:
- the user or purchaser;
 - the building control body;
 - consultants (including architects, mechanical and electrical consultants, and fire engineering consultants);
 - authorities having jurisdiction (AHJs); and
 - any relevant specialists in respect of the ASE (e.g. the fire alarm contractor).

- b) Responsibility for the design of the interface between the fire detection and fire alarm system and the ASE, including the interconnections, should be clearly defined.

NOTE 1 This is often the designer of the fire detection and fire alarm system.

- c) Where the interface between ASE and a fire detection and fire alarm system is the responsibility of an organization other than the installer of the fire detection and fire alarm system, the responsibility of that organization and any other organization, such as the fire alarm installer, should be clearly defined and documented.
- d) Where the fire strategy specifies a particular actuation arrangement, as part of the cause and effect of the fire detection and fire alarm system, the details of the actuation arrangements, as well as the cause and effect schedule, should be documented within the fire safety information for the building.

NOTE 2 In England and Wales, Regulation 38 of the Building Regulations 2010 [1] requires that fire safety information is provided to the responsible person not later than the date of completion of the work, or the date of occupation of the building or extension, whichever is the earlier. In Scotland, the Building (Procedure) (Scotland) Regulations 2004 [2] require that a fire safety design summary, incorporating information on services and equipment installed in the building, is provided along with the completion certificate to the building control verifier. There is no equivalent requirement in Northern Ireland.

- e) The information within the fire safety documentation for the building, regarding the actuation and cause and effect arrangements, should enable the building user to understand the cause and effect schedule together with any supporting reasoning. The following documents should be included within the fire safety information:
- where there is a variation in the actuation arrangement from the recommendations of this, or any other, British Standard, justification for the variation;
 - the actuation arrangement upon receipt of a specified signal from the fire detection and fire alarm system;