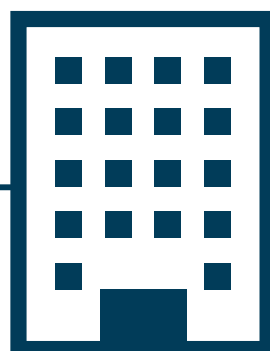


**Guidance
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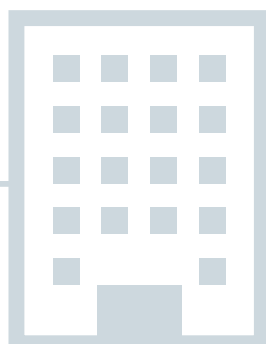
Fire Industry Association



**FIA Application Guidance
on BS 7273-4:2015**

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1. INTRODUCTION

This FIA application guidance provides information to help understand BS 7273-4:2015. This must be read in conjunction with the Standard which takes precedence.

2. OVERVIEW

BS 7273-4 Code of Practice for the operation of fire protection measures – part 4: Actuation of release mechanisms for doors was published on 30 June 2015. It replaces the 2007 version, which is superseded.

It recommends how to actuate mechanisms that unlock, release or open doors in the event of fire in all buildings including dwellings (except where stated).

It provides recommendations for the design, installation, commissioning and maintenance of electrical control arrangements for the actuation of mechanisms that unlock, release or open doors in the event of fire. It applies to all aspects of the interface between these mechanisms and a fire detection and fire alarm system, including interfaces that incorporate acoustic coupling and radio transmission.

It also enhances some of the recommendations of BS 5839-1, with regard to detector siting and spacing in certain categories of system (see Section 5) therefore both Standards should be referred to when specifying systems.

Three categories of actuation are described:

- Critical (Category A) failsafe for specific EN 54-2 faults and the additional conditions given in Table 1 of the Standard.
- Standard (Category B) failsafe for the conditions given in Table 1 of the Standard.
- Indirect (Category C) failsafe for the conditions given in Table 1 of the Standard.

BS 7273-4 defines failsafe as electronically controlled actuation arrangements for release mechanism(s) designed such that specified features result in the release of the door from its pre-actuation state (ie held open or locked).

The Standard states that within premises, each door should to be considered, and allocated an appropriate category of actuation. However, it recognises that where the position of any door matches more than one description, for each of which a different category of actuation is recommended, the highest recommended category should apply.

This should be specified in the Fire Risk Assessment or Fire Strategy.

Guidance on selection of category can be found in Annex B of the Standard.

2.1. What is a door release mechanism?

Door release mechanisms are typically:

1. Electromagnetic door holders that release self-closing doors in an emergency.
2. Electromagnetic locks that prevent unauthorised access but release in an emergency.
3. Powered sliding doors that open in an emergency.

2.2. Why install door release mechanisms?

Door release mechanisms are installed for:

1. **Convenience:** Automatic doors that need to open in case of fire, such as doors to shops.
2. **Accessibility:** Doors that are normally kept open but need to close in case of fire, such as fire doors in corridors.
3. **Security:** Controlled access doors that need to release in case of fire such as doors to staff areas.

3. CATEGORIES OF ACTUATION

Clause 4 of BS 7273-4:2015 defines the categories of failsafe activation and this is further described in Table 1. The three categories are distinguished by the conditions that would cause activation of the failsafe release mechanisms. Table 1 below, highlights the fault conditions and the respective categories.

Description		CATEGORY			BS7273 P4 2015 origin reference
		Critical (A)	Standard (B)	Indirect (C)	
Critical path S/C or O/C fault	Note C	✓ < 120 sec	✓ < 120 sec	✓ < 120 sec	Table 1 a)
Low voltage supply on non self-closing devices		✓ < 03 sec	✓ < 120 sec	✓ < 120 sec	Table 1 b)
Low voltage supply on self-closing devices	Note D	✓ < 60 sec	✓ < 60 sec	✓ < 60 sec	Table 1 b)
Radio communication link failure		✓ < 06 min	✓ < 120 sec	✓ < 120 sec	Table 1 g1)
Alarm primary supply fault*	Note A	✓ < 33 min 40 sec	x	x	EN54-4
Secondary supply fault*	Note A	✓ < 18 min 40 sec	x	x	EN54-4
Primary & secondary supply fault	Note A	✓ < 120 sec	x	x	Table 1 c)
S/C or O/C fault between separate fire alarm CIE	Note A	✓ < 120 sec	x	x	Table 1 e)
Detection or call point zone or loop S/C or O/C fault*	Note A	✓ < 3 min 40 sec	x	x	EN54-2
Detection or call point removal*	Note A	✓ < 3 min 40 sec	x	x	EN54-2
Earth fault*	Note A	✓ < 3 min 40 sec	x	x	EN54-2
Fuse rupture fault*		✓ < 3 min 40 sec	x	x	EN54-2
S/C or O/C fault in cable to other control equipment	Note A	✓ < 120 sec	x	x	Table 1 d)
System watchdog fault*		✓ < 3 min 40 sec	x	x	EN54-2
Fire alarm system component disablement	Note A	✓ < 120 sec	x	x	Table 1 f)
S/C or O/C fault in cable to radio transmitter external to CIE		✓ < 120 sec	✓ < 120 sec	✓ < 120 sec	Table 1 g2)
Failsafe on any other fault conditions		✓ Note B	✓ Note B	✓ Note C	
<p>Note A = That part of the fire alarm system with a scope that could affect the actuation of door release mechanism.</p> <p>Note B = Must consider risk to occupants of unnecessary release.</p> <p>Note C = Link to door release equipment is via other controls; critical path ends at other controls.</p> <p>Note D = Unless the operating principle of a door release mechanism inherently causes doors to release on failure of power supply.</p> <p>* Faults defined by EN54-2 and EN54-4 (times given are a summation of EN54 limits and BS7273-4).</p>					

Table 1: Non-fire conditions that should result in releasing or unlocking of a door

3.1. Which categories should be used for doors with electromagnetic door holders?

Table B.1 of BS 7273-4:2015 describes the selection of category of actuation for the release of self-closing fire doors.

3.1.1. Critical (Category A) only

This category can be used in any situation but must be used in the situations listed below:

1. Where the fire door is in a compartment wall separating buildings.
2. Where the fire door is on a stairway in places of public entertainment and buildings where people sleep, such as hotels, HMOs, care homes, etc (but not in hospitals – refer to Department of Health recommendations).
3. Where the fire door is on a stairway that is the only one serving a building with more than one storey above or below ground (but not in dwellings).

3.1.2. Standard (any Category A, B or C)

This category can be used in any situation except where Category A is required.

1. Where the fire door is on a stairway or fire-resisting lobby that forms part of the means of escape that is not covered by A.2. above.
2. Where the fire door divides a corridor.
3. Where the fire door is in a dwelling, except within a staircase enclosure in an HMO.
4. For any other fire door.

3.2. Which categories should be used for doors with electromagnetic locks?

Table B.2 of BS 7273-4: 2015 describes the selection of category of actuation for the release of electronically locked doors on means of escape from buildings.

Note 1: Acoustically actuated systems are not acceptable.

Note 2: Enforcing authorities may not allow electronically secured doors.

Note 3: In some premises electronic security might be vital and special requirements may apply.

3.2.1. Critical (Category A)

1. Where the fire door is in premises occupied by or open to the public (eg shopping centres, hotels/boarding houses and museums).
2. Where the fire door is in a hostel with long-term occupants, residential care facilities and hospitals.
3. Where the fire door is in a school.

3.2.2. Critical (any Category A, B or C)

1. Common places of work, not generally occupied by significant members of the public (eg offices, factories and warehouses) where staff are trained in the fire safety provisions of the building.

3.3. Which categories should be used for powered sliding doors?

Table B.3 of BS 7273-4:2015 describes the selection of category of actuation for the release of powered sliding doors on means of escape from buildings.

3.3.1. Critical (any Category A, B or C)

1. Common places of work, not generally occupied by significant members of the public (eg offices, factories and warehouses) where staff are trained in the fire safety provisions of the building.

Note 1: Acoustically actuated systems are not acceptable in this case.

2. Where the fire door is in premises occupied by or open to the public (eg shopping centres, hotels/boarding houses museums).

3. Where the fire door is in a hostel with long-term occupants, residential care and hospitals.

4. Where the fire door is in a school.

Note 2: If the doors cannot be opened by manual means in 2, 3, 4 above then Category A should be adopted.

4. TYPICAL ACTUATION ARRANGEMENTS FOR RELEASE MECHANISMS

BS 7273-4:2015 Clause 9, 10 and Annex C give information and diagrams relating to examples of typical connections between the fire alarm and door release mechanisms.

Features of the CIE as described in Table 1 will determine if a particular arrangement complies with the recommendations of category A, B or C.

Annex C defines typical actuation arrangements as:

- a) Connection of the power supply to the release mechanism via a relay at the fire alarm CIE, often described as the 'common fire relay', so that the power supply is interrupted in the event of a fire signal (see Figure 1a); this also includes connection to a CIE that has a common fire relay and a fault relay that opens on failure of the primary and secondary power supplies.

Note: The fire and fault configuration is suitable for critical actuation (Category A) if the CIE can be configured such that the common fault relay operates when there is a disablement.

These wires should not be run in the same cable because, in the event of a short-circuit fault, the release mechanism will remain energised, except if its power supply fails.

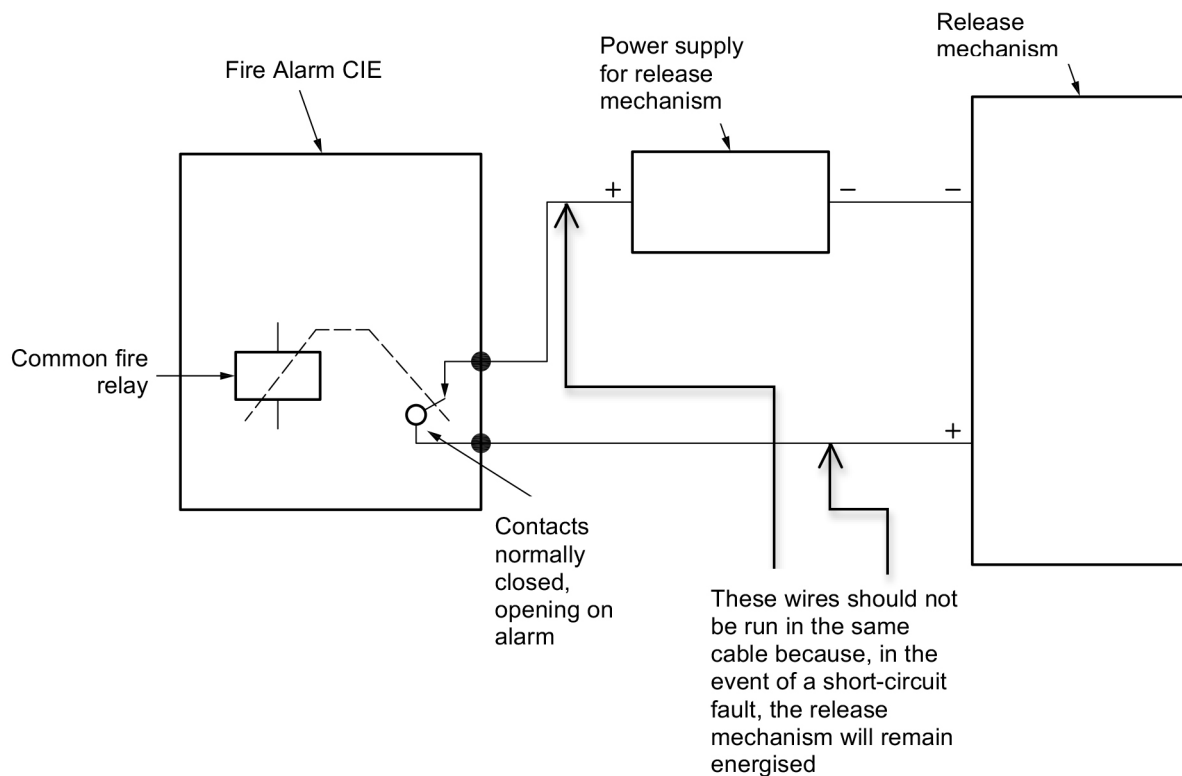
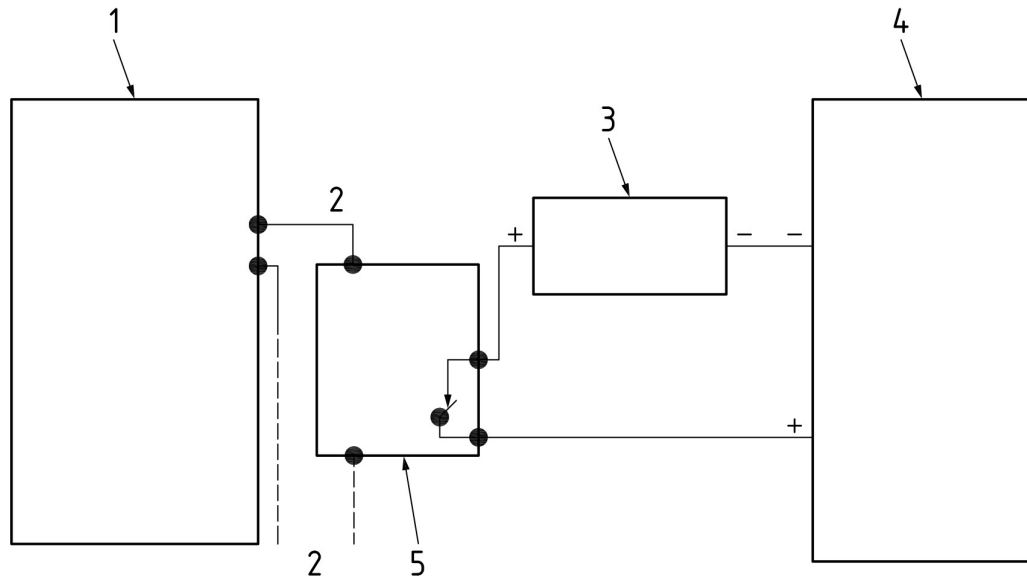


Figure 1

b) Connection of the power supply via an input/output unit connected to a fire detection circuit of an addressable fire detection and fire alarm system.

Loop isolators are required either side of the I/O unit. See Figure 2 below.

Note: for this arrangement to comply with category A, manufacturers of I/O modules should declare that it is compliant with all the recommendations of Table 1 of BS 7273-4:2015. For example, loss of loop power to the module should cause the release of the door mechanism.



Key

- | | | | |
|---|------------------------------------|---|----------------------------|
| 1 | Addressable fire alarm CIE | 4 | Release mechanism |
| 2 | Loop | 5 | Loop output interface unit |
| 3 | Power supply for release mechanism | | |

Figure 2: Use of addressable loop device to actuate release mechanisms

c) Actuation of electrically powered hold-open devices by an acoustic signal (the audible fire signal in the building).

d) Actuation of electrically powered hold-open devices by a radio signal (or discontinuation of a radio signal).

e) A combination of acoustic and radio interconnection is also possible (eg an acoustic signal can be used to trigger a radio transmitter).

5. SPACING OF DETECTORS

Generally, in buildings in which a Category L1, L2 or L3 system is present, no special considerations for the design of the fire detection and fire alarm system are necessary; the selection, provision and siting of automatic fire detectors will already be sufficient.

Where Category L4, L5 or M systems are installed clause 12 of BS 7273-4 provides guidance on the provision of fire detection to comply with the requirements of the Standard.

DISCLAIMER

The information set out in this document is believed to be correct in the light of information currently available but it is not guaranteed and neither the Fire Industry Association nor its officers can accept any responsibility in respect of the contents or any events arising from use of the information contained within this document.



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