

Door release mechanisms (to comply with BS 7273-4:2007)

THESE APPLICATION NOTES ARE BASED ON OUR INTERPRETATION OF THE CURRENT RELEASE OF BS7273-4:2007.



The British Standard BS 7273-4:2007 is a 'Code of practice for the operation of fire protection measures' specifically for the 'Actuation of release mechanisms for doors'.



The recommendations within BS7273-4:2007 have been introduced to ensure building occupants can safely evacuate and also slow the rate of fire spread within the building.

The standard covers three types of door release mechanisms:

- devices to hold open self closing doors
- devices to secure doors on means of escape. For example doors that need to be released to are those that:
 - a) allow occupants to be evacuated
 - b) give access for fire fighting and for rescue purposes
 - c) control the spread of fire and smoke
- powered sliding doors on main escape.

Design considerations

We recommend the control of the door release mechanisms should take place at the same level of protection or category for the fire detection system, as per BS 5839-1, is selected:

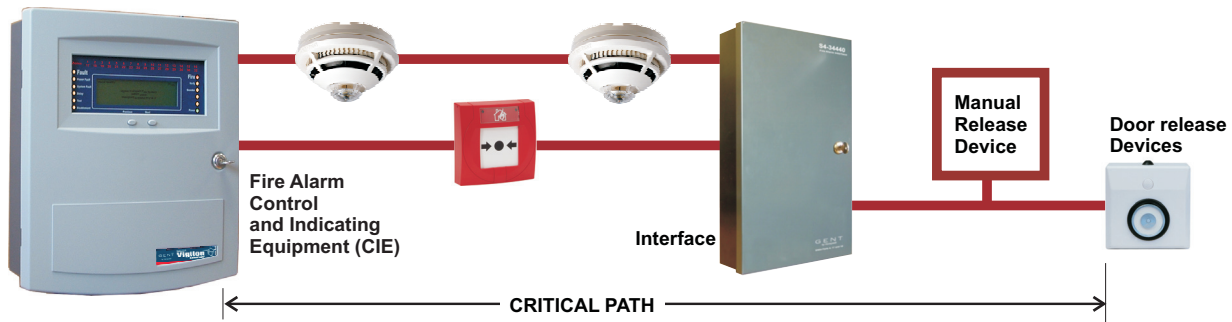
- during the fire risk assessment stage decide on which Category A, B or C is applicable for each door release in a building. Different categories may apply to different doors within the building, as per Annex A of BS 7273-4:2007.



We strongly recommend that a risk assessment is carried out in consultation with all the interested parties to agree on the Categories for each door and included in the overall fire plan or cause & effect.

- seek advice from 'Building Control', 'Fire and Rescue Authorities' and the building occupier /user.
- select only door release mechanisms that comply with the respective British Standard:
 - BS 5839-3 or BS EN 1155 for door closers
 - BS EN 12209:2009 for electronic locks
 - BS 7036-2 for powered sliding doors
- agree on the method of actuation including any manual release controls
- ensure the correct labels and warning notices are provided
- ensure the detector spacing is correct, especially for Category M or L4 of BS 5839-1 as in certain cases the recommendations in BS 7273-4:2007 over rule those in BS5839-1.
- ensure all cable used for door release mechanism is not less than 1mm²
- if a separate access control panel is being used to control the door release devices and a Category A or Category B door release system is required, then all the release mechanism need to be controlled directly by the fire alarm system and not by the access control panel, see diagram on page 4.

Critical Path



Category A Operation

The Category A operation requires 'door release outputs' and subsequently the door release mechanisms to operate in the event of a fire or a fault on the critical path, that could prevent a fire signal activating the release mechanisms:

- Any other condition on the system that may prevent the detection of a fire or the operation of an output, see list on page 3.

All release mechanisms identified as Category A should be wired using a S4-34440 Interface unit on the Vigilon loop, with output configured for Category A operation.

Category B Operation

The Category B operation require 'door release outputs' and subsequently the door release mechanisms to operate when there is:

- a wiring fault between the Fire alarm Control and Indicating Equipment (CIE) and the door release hardware, see list and notes on page 3 or
- loss of power to the door release mechanism, see page 3.

All release mechanisms identified as Category B should be wired using a S4-34440 Interface unit on a Vigilon loop, with output configured for Category B operation.

If the door release is controlled by another system then the release device will need to be fail-safe during loss of power. For power sliding doors a monitored battery backed power supply is required to ensure door release mechanism has power to fail safe with a wiring fault.

Category C Operation

The Category C operation is as per Category B but the door release mechanism is controlled by a separate Access control panel. The link between the Fire CIE and the Access control panel should be via a single powered output from a S4-34440 Interface unit, see diagram on page 4.



If the door release is controlled by another system then the release device will need to be fail-safe during loss of power. Also for power sliding doors a monitored battery backed power supply may be required to ensure door release mechanism has power to fail safe when there is a wiring fault.

S4-34440 Fire alarm interface

The door release functionality is achieved using the S4-34440 Mains Powered interface units on a Vigilon system loop with the system configured to provide interface output to operate the door release in accordance with Category A, B or C of BS 7273-4:2007.



In the Vigilon system the delay duration is made configurable because it may be insufficient for some operations such as when reallocating large loops. Any changes to the delays outside the requirements of the standard must be agreed with the interested parties.

Door release mechanisms

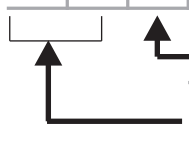
Fail-Safe

A fail-safe operation is when the output is operated to release doors when the interface loses connection or communication with the fire alarm system after a pre-determined time period. The fail-safe can be used for all types of other output applications.

Categories and Fail safe operation

For full lists refer to sections 5.1.1 to 5.1.3 in BS 7273-4:2007

Category A	Category B	Category C	Events monitored and controlled	Fault indication & activation within..
✓	✓	✓	Any Open or Short circuit of critical path	2 minutes
✓	✓	✓	Reduction in power voltage below the level necessary to maintain the release mechanism in a non fire state.	3 seconds, except for closing doors 60s is acceptable
✓			Failure of normal power supply which the mechanism depends	32 minutes
✓			Failure of standby power supply which the mechanism depends	17 minutes
✓			Failure of normal and standby power supplies simultaneously	2 minutes
✓			Open or Short circuit to Manual Call Point or detectors that control specific release mechanisms	2 minutes
✓			Removal of Manual Call Point or Detector that control release mechanism	2 minutes
✓			Any earth fault that could prevent a release mechanism being initiated	2 minutes
✓			Open or Short circuit between separate Fire Control panels	2 minutes
✓			Software fault as detailed within EN 54:2 sections 13.4 - 13.6	2 minutes
✓			Disablement of Manual Call Point or Detector on which the mechanism depends	2 minutes
✓			Failure of Radio communication from transmission equipment to release mechanism	6 minutes
	✓	✓		120 minutes
✓	✓	✓	Open or Short circuit on critical path between transmission equipment and Control & Indicating Equipment (CIE)	2 minutes


Category C: There is no direct connection between CIE and the release mechanism. Critical path is deemed to be between CIE and other control equipment, eg Access Control.

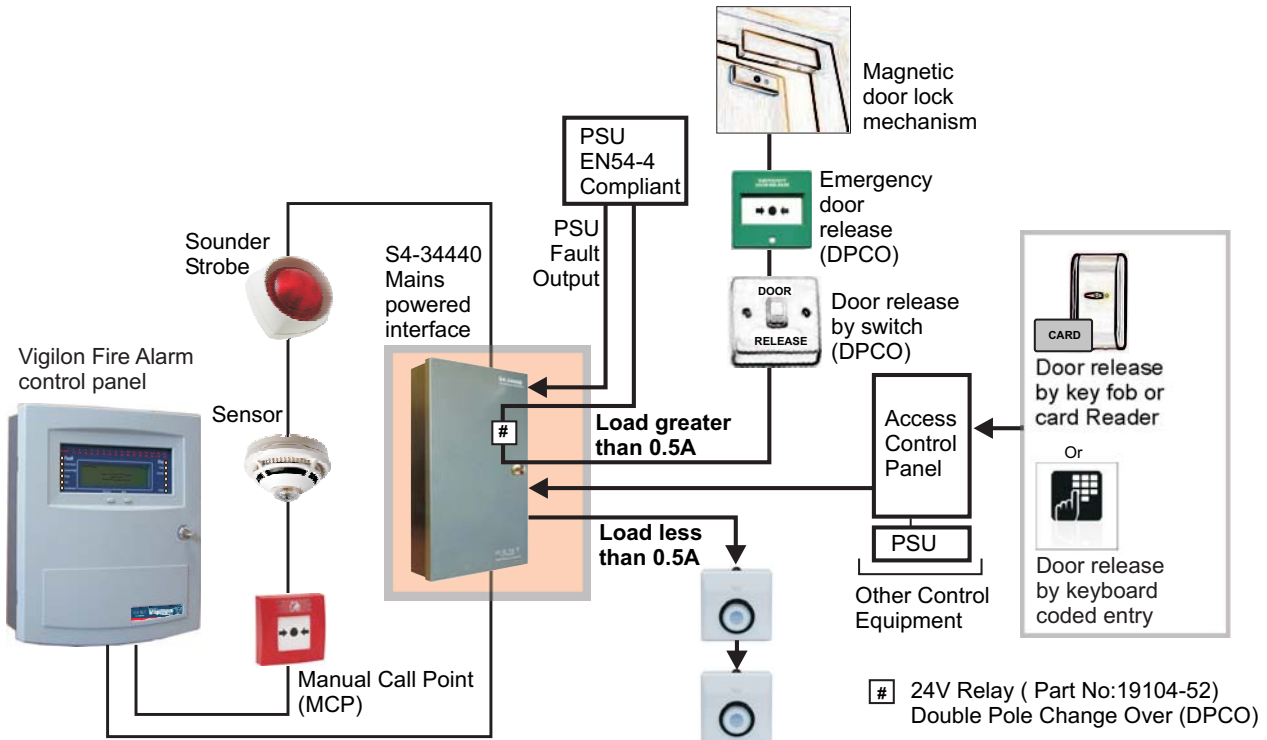
Category A & B: There is direct connection between CIE and release mechanism. Critical path is deemed to be at CIE.

Vigilon System

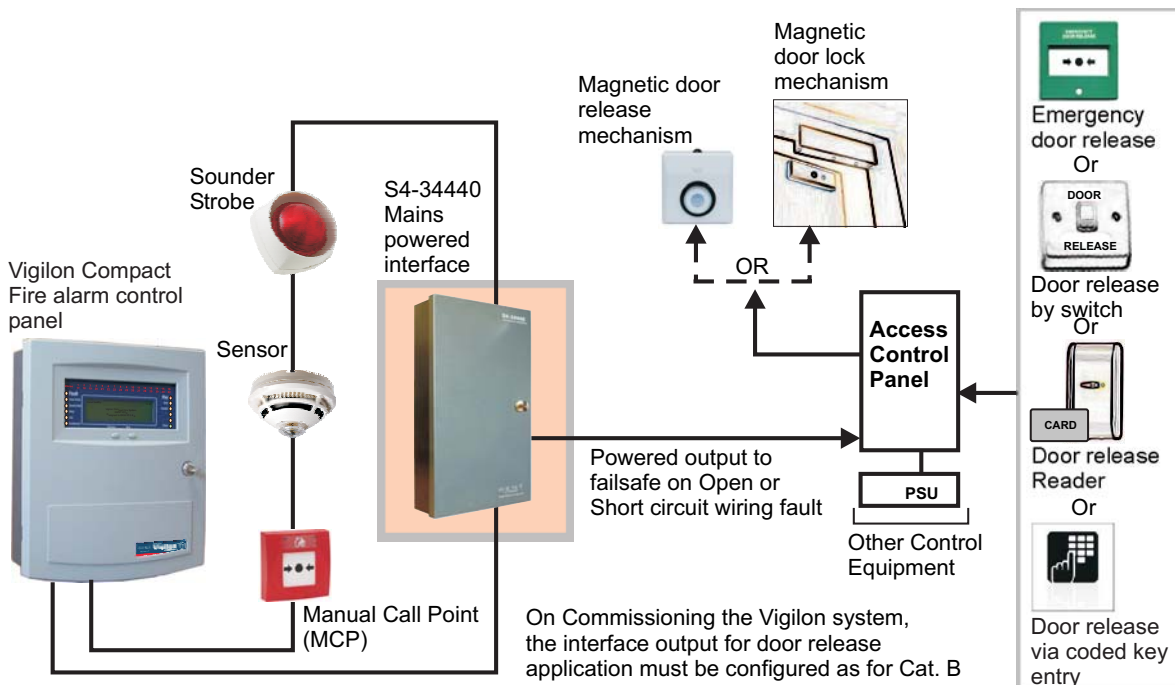
The Category A operation as implemented in a **Vigilon System** follow the recommendations of BS 7273-4:2007. The following are further notes in relation to Category A output operation, the outputs are not operated, that is doors are not released where:

- the fire detection and output functions in the system are not affected by single break / short on the loop wiring
- the batteries provide power to the main control panel or to the interface itself in the event of a local mains failure
- the mains supply provide power to the main control panel or to the interface itself in the event of a local battery failure
- the fire detection and output functions in the system are not affected by failure of fuses in the system
- the fire detection and output functions are not affected by earth faults in the system
- the Vigilon system recovers from a system fault within 120 seconds.

Typical Category A/B door release (with or without an Access Control panel)



Typical Category C door release (using an Access Control panel)



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