

BRITISH STANDARD

Code of practice for the operation of fire protection measures –

Part 3: Electrical actuation of pre-action watermist and sprinkler systems

ICS 13.220.20



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ISBN 978 0 580 58175 5

The following BSI references relate to the work on this standard:

Committee reference FSH/12/4

Draft for comment 07/30160342 DC

Publication history

First published October 2000

Second edition, January 2008

Amendments issued since publication

Amd. no.	Date	Text affected
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Foreword

Publishing information

This part of BS 7273 is published by BSI and came into effect on 31 January 2008. 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 this committee can be obtained on request to its secretary.

Supersession

This part of BS 7273 supersedes BS 7273-3:2000, which is withdrawn.

Relationship with other publications

BS 7273 is published in a series of 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*.

Parts 1 and 2 give recommendations for the electrical and mechanical actuation of gaseous fire extinguishing systems respectively. Part 4 gives recommendations for the actuation of release mechanisms for doors. Part 5 provides recommendations for electrical actuation of watermist systems (other than pre-action watermist systems). This current part of BS 7273 provides recommendations for the electrical actuation of pre-action watermist and sprinkler systems.

Recommendations for the design, installation, commissioning and maintenance of fire detection and fire alarm systems are given in BS 5839-1. Recommendations for the design, installation, commissioning and maintenance of sprinkler systems are given in BS EN 12845. Recommendations for the design, installation, commissioning and maintenance of watermist systems will be given in DD 8489-1, which is currently in preparation. It is anticipated that an amendment will be issued to BS 7273-3 when DD 8489-1 is published.

Information about this document

This is a full revision of BS 7273-3. The principal changes from the previous edition are as follows.

- The scope of the standard now includes pre-action watermist systems.
- References have been updated.
- Terminology has been brought into line with related standards, particularly in relation to control and indicating equipment.
- Reference is made to DD 8489-1 and BS EN 12845.

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 British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Hazard warnings

CAUTION. Certain electromagnetic fields, such as those generated by radio frequency transmitters, could potentially trigger the charging of pre-action watermist and sprinkler systems or cause them to malfunction. In such cases it is appropriate to take action to minimize the risk of unintentional charging of the pipework due to the electromagnetic field radiated by such apparatus. It might be necessary to seek specialist advice.

Presentational conventions

The provisions in 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.

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.

Introduction

A pre-action sprinkler system is a fire extinguishing system which consists of a sprinkler system and an electrical detection system with water held back by the pre-action valve and pressurized air in the sprinkler pipework. In the event of the operation of the electrical detection system, the pre-action alarm valve operates and allows water into the sprinkler pipework. Pre-action watermist systems work on the same principle.

Two generic forms of operation exist: type A and type B.

In the case of a type A pre-action system, water will only enter the pipework following the operation of the detection system. Accordingly, type A pre-action systems will only discharge water onto the seat of the fire when both the electrical detection system and any automatic sprinkler head or watermist nozzle has operated. Any accidental damage to the sprinklers/watermist nozzles, or pipework, will not cause water to be discharged.

Type A systems are, therefore, suitable for use in situations in which:

- there is high potential for mechanical damage to the system; or
- the probability of mechanical damage might not be high, but the consequences of inadvertent water damage would include serious damage to sensitive contents and/or major interruption to business.

Type B pre-action systems will discharge water onto the seat of a fire when any sprinkler or watermist nozzle operates, whether or not the electrical detection system has operated. However, normally the fire detection system will operate before a sprinkler head or watermist nozzle so that, in effect, the system is “wet” at the time of watermist/sprinkler operation. Type B systems are normally used in circumstances in which there is a need to speed up the operation of a dry system.

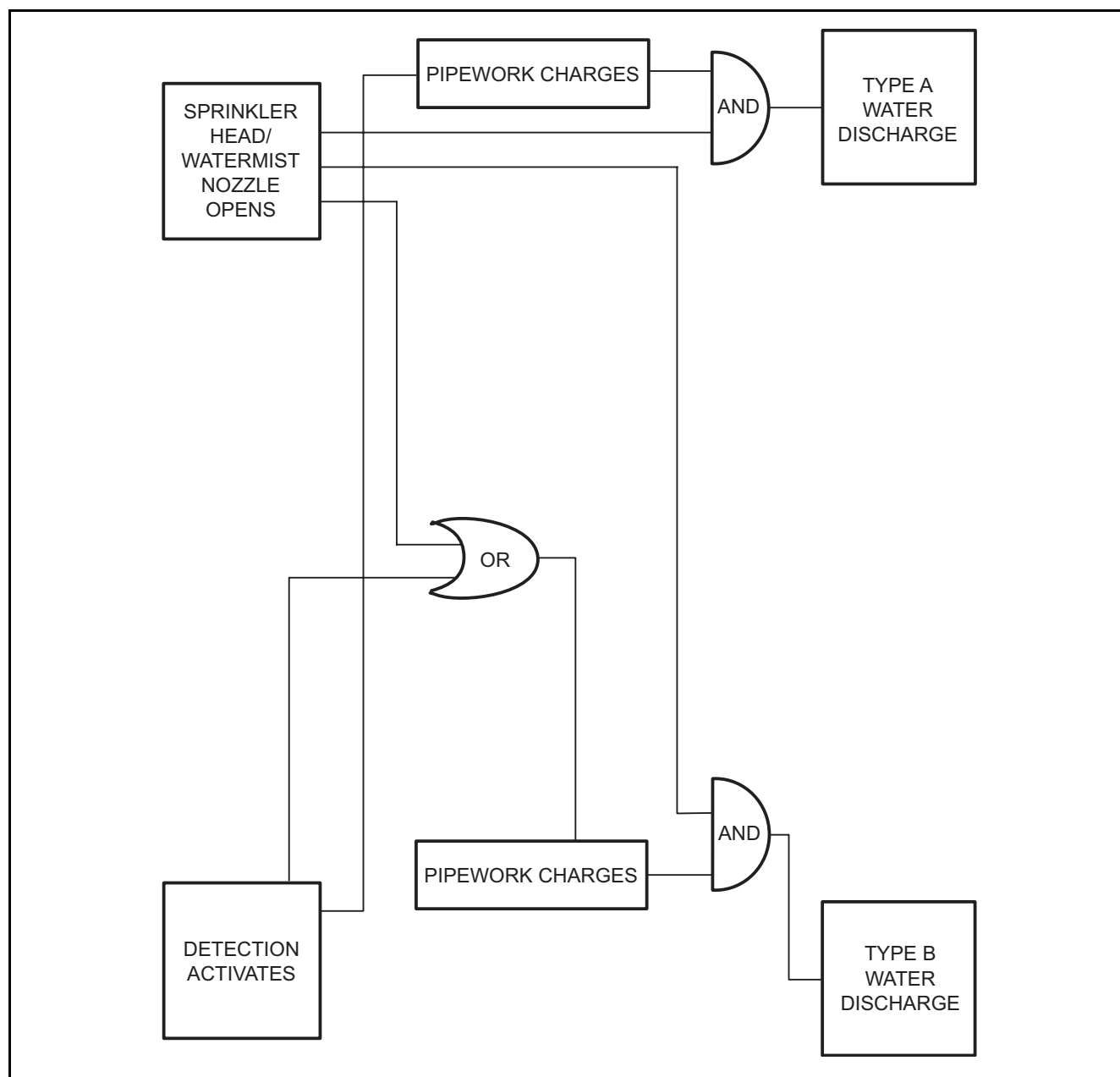
The functions of the two systems can be depicted by the binary logic sequence using “and” and “or” gates as given in Figure 1.

It is of importance that fire detection systems and any interfaces associated with pre-action watermist and sprinkler systems have high integrity and do not cause the pre-action alarm valve to remain closed under fire conditions.

It is also important to avoid inadvertent operation of the pre-action alarm valve, as draining down of the system can be time consuming and inconvenient.

The recommendations in this part of BS 7273 take these factors into account, as well as the recommendations of the relevant British and European Standards covering fire detection and fire alarm systems (BS 5839 and BS EN 54) and sprinklers (BS EN 12845). The standard for watermist systems has not yet been published, and is expected to be issued as a Draft for Development (DD 8489) in due course. The recommendations relating to watermist in this part of BS 7273 have been developed in liaison with FSH/18, the committee working on DD 8489.

Figure 1 Typical logic gate depiction of pre-action systems



In some applications (e.g. cold stores), the consequences of inadvertent discharge are so severe that “double interlocked” pre-action systems are sometimes used. In these systems, water is only allowed to enter the pipework if both the electrical detection system and an automatic sprinkler head/watermist nozzle have operated. This differs from a type A system in that the system remains dry if only the electrical detection system has operated.

These and certain other types of pre-action system such as recycling systems are not covered in BS EN 12845 or DD 8489 and are not addressed in this British Standard.