SLOVENSKI STANDARD
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Požarna zaščita - Avtomatski sprinkler sistemi - 3. del: Zahteve in preskusne metode za suhe alarmne ventile

Fire protection -- Automatic sprinkler systems -- Part 3: Requirements and test methods for dry pipe valves

Protection contre l'incendie -- Systèmes d'extinction automatiques du type sprinkler -- Partie 3: Prescriptions et méthodes d'essai des postes de contrôle sous air

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INTERNATIONAL STANDARD

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Fire protection — Automatic sprinkler systems —

Part 3:

Requirements and test methods for dry pipe valves

Protection contre l'incendie — Systèmes d'extinction automatiques du type sprinkler —
Partie 3: Prescriptions et méthodes d'essai des postes de contrôle sous air

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Contents

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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.

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.

International Standard ISO 6182-3 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Sub-Committee SC 5, *Fixed fire extinguishing systems*.

ISO 6182 consists of the following parts, under the general title *Fire protection — Automatic sprinkler systems*:

— *Part 1: Requirements and test methods for sprinklers*

— *Part 2: Requirements and test methods for wet alarm valves, retard chambers and water motor alarms*

— *Part 3: Requirements and test methods for dry pipe valves*

— *Part 4: Requirements and test methods for quick-opening devices*

— *Part 5: Requirements and test methods for deluge valves*

Annex A of this part of ISO 6182 is for information only.

Introduction

ISO 6182 comprises several parts prepared by ISO/TC 21 covering components for automatic sprinkler systems.

ISO 6182 is included in a series of International Standards planned to cover:

— carbon dioxide systems (ISO 6183);

— explosion protection systems (ISO 6184);

— foam systems (ISO 7076).

Fire protection — Automatic sprinkler systems —

Part 3:
Requirements and test methods for dry pipe valves

1 Scope

This part of ISO 6182 gives performance and other requirements, recommendations, and tests for dry pipe valves and relevant trim, as specified by the manufacturers, used in dry pipe automatic sprinkler systems for fire protection service.

Performance and test requirements for other auxiliary components or attachments to dry pipe valves are not covered by this part of ISO 6182.

All pressure data in this part of ISO 6182 are given as gauge pressure in bar[1)].

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6182. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6182 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 37:1977, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

ISO 898-1:1988, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs.*

ISO 898-2:1992, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread.*

1) 1 bar = 10^5 Pa = 0,1 MPa

3 Definitions

For the purposes of this part of ISO 6182, the following definitions apply.

3.1 alarm device: Mechanical or electrical device to sound an alarm upon operation of the dry pipe valve.

3.2 anti-reseat latch: Mechanism that prevents the sealing assembly from returning to its set position after operation.

3.3 automatic drain valve: Normally open device that automatically drains water from and vents the intermediate chamber of a dry pipe valve to the atmosphere when the dry pipe valve is in the ready position, and limits water flow from the chamber after the dry pipe valve has tripped.

3.4 clapper: A type of sealing assembly (see 3.17).

3.5 corrosion-resistant material: Corrosion-resistant materials shall be either:

— metallics of bronze, brass, Monel metal, austenitic steel, or equivalent; or

— plastics conforming with the requirements of 6.2 and 6.3.

3.6 differential: Ratio of service pressure to system air pressure (expressed as gauge pressures) at the trip point (see 3.22).

3.7 dry pipe valve: Valve of the check type in which air pressure in the sprinkler system prevents water from filling the system. Loss or partial loss of air pressure in the system causes automatic operation

of the dry pipe valve admitting water into the system.

3.8 differential-type dry pipe valve: Type of dry pipe valve in which air pressure in the system acts directly and/or indirectly on the sealing assembly to maintain it in the closed position. The air seat of the sealing assembly is of equal or larger diameter than the diameter of the water seat of the sealing assembly, with the two separated by an intermediate chamber maintained at atmospheric pressure.

3.9 flow velocity: The rate of water flow through a dry pipe valve expressed as the equivalent water velocity through a pipe of the same nominal size as the dry pipe valve.

3.10 intermediate chamber: That part of a dry pipe valve which separates the air and/or water sealing assembly seating surfaces and is at atmospheric pressure when the valve is in the ready condition.

3.11 leak point: System air pressure for a specific service pressure at which water begins to flow from the intermediate chamber, automatic drain valve or alarm connection.

3.12 mechanical-type dry pipe valve: Type of dry pipe valve in which the air pressure in the system acts on the sealing assembly and linking mechanism to maintain it in the closed position.

3.13 priming water: Water used to seal a sealing assembly and prevent cementation of working parts.

3.14 rated working pressure: Maximum service pressure at which a dry pipe valve is intended to operate.

3.15 ready condition: State of a dry pipe valve installed in a piping system and filled with air or inert gas at a predetermined pressure, to maintain the dry pipe valve in a closed position and prevent the downstream pipework filling with water.

3.16 reinforced elastomeric sealing element: Element of clapper, clapper assembly or seat seals in a composite of an elastomeric compound with one or more other components that increase the tensile strength of the combination to at least twice that of the elastomeric material alone.

3.17 sealing assembly: Main movable sealing element (such as a clapper) of the valve, which maintains air pressure in the system piping.

3.18 sealing assembly seat ring: Main fixed sealing element of a dry pipe valve, which maintains air pressure in the system piping.

3.19 service pressure: Static water pressure at the inlet to a dry pipe valve when the valve is in the ready condition.

3.20 system air pressure: Static air pressure at the main outlet of a dry pipe valve in the ready condition.

3.21 trim: External equipment and pipework, excluding the main installation pipework, fitted to a dry pipe valve.

3.22 trip point: Point at which a dry pipe valve operates, admitting water into the sprinkler system installation, measured in terms of the system air pressure and service pressure.

3.23 water motor alarm: Hydraulically actuated device which provides a local audible alarm as a result of flow through a dry pipe valve.

3.24 water motor transmitter: Hydraulically actuated device which generates an electrical current for a remote alarm as a result of operation of the dry pipe valve.

4 Dry pipe valve requirements

4.1 Nominal sizes

The nominal size of a dry pipe valve shall be the nominal diameter of the inlet and outlet connections, i.e. the pipe size for which the connections are intended. Sizes shall be 40 mm, 50 mm, 65 mm, 80 mm, 100 mm, 125 mm, 150 mm, 200 mm or 250 mm.

NOTE 1 The diameter of the waterway through the sealing assembly seat ring may be less than the nominal size.

4.2 Connections

All connections shall be suitable for use at the rated working pressure of the dry pipe valve.

NOTE 2 The dimensions of all connections should conform to International Standards where these exist. National standards may be used where International Standards are not appropriate.

4.3 Rated working pressures

The rated working pressure shall be not less than 12 bar (1,2 MPa).

Inlet and outlet connections may be machined for lower working pressure to match installation equipment of a lower working pressure, in which case the valve shall be marked with the lower working pressure [see 7.2 f)].

4.4 Bodies and covers

4.4.1 If non-metallic materials (other than gaskets and seals) or metals with a melting point of less than 800 °C (other than gaskets and seals) form part of the dry valve body or cover, the assembled valve, after subjection to the fire exposure test of 6.12, shall withstand a hydrostatic pressure test without permanent deformation or failure and the sealing assembly shall open freely and fully.

4.4.2 The body and cover shall be made of a material with corrosion resistance at least equivalent to that of cast iron. For extreme corrosion conditions, other materials can be necessary.

4.4.3 It shall not be possible to assemble the dry pipe valve with the cover plate in a position which either improperly indicates flow direction or so affects the operation of the dry pipe valve that it does not meet the requirements of this part of ISO 6182 [see 7.2 d) and 7.2 h)].

4.5 Strength

4.5.1 The assembled dry pipe valve, with the sealing assembly open, shall withstand, without rupture, an internal hydrostatic pressure of four times the rated working pressure for a period of 5 min when tested in accordance with 6.8.

4.5.2 The calculated design load of any fastener, neglecting the force required to compress the gasket, shall not exceed the minimum tensile strength specified in ISO 898-1 and ISO 898-2 when the dry pipe valve is pressurized to four times the rated working pressure. The area of the application of pressure shall be calculated as follows.

a) If a full-face gasket is used, the area of application is that extending out to a line defined by the inner edge of the bolts.

b) If an "O"-ring seal or ring gasket is used, the area of application is that extending out to the centre-line of the "O"-ring or gasket.

4.6 Drains

4.6.1 Dry pipe valve

The dry pipe valve shall be provided with a tapped opening to drain water from the valve body when the valve is installed in any position specified or recommended by the manufacturer. The minimum opening size shall be 20 mm nominal.

NOTE 3 If the drain opening on the valve is to be used for draining pipework, then the size of the opening should comply with any national standard which may be applicable (see 4.2).

4.6.2 Automatic drain valves for intermediate chambers

4.6.2.1 The intermediate chamber of a dry pipe shall be provided with an automatic drain valve.

4.6.2.2 Automatic flow or velocity drain type valves employed for normally venting intermediate chambers shall close at a pressure of not more than 1,4 bar (0,14 MPa) with a flow rate through the drain valve just prior to closure of between 0,13 l/s and 0,63 l/s.

4.6.2.3 Automatic drain valves shall remain closed during system drainage until the pressure effective at the sealing mechanism (e.g. ball) becomes less than 1,4 bar (0,14 MPa) and shall open at a pressure between 0,035 bar (0,003 5 MPa) and 1,4 bar (0,14 MPa).

4.6.2.4 The flow through an open end or velocity type drain valve shall not exceed 0,63 l/s at any service pressure up to the rated working pressure.

4.7 Access for maintenance

Means shall be provided to permit access to working parts and to allow removal of the sealing assembly.

NOTE 4 Any method adopted should permit ready maintenance by one person with a minimum of down-time.

With the exception of the valve seat, all parts intended for field replacement shall be capable of being disassembled and reassembled with tools normally employed by the trade.

4.8 Connections

4.8.1 If priming water is required to seal the air seat an external means shall be provided to allow priming water to enter.

4.8.2 To prevent water columning and to facilitate water level checking, one or more ports shall be provided.

4.8.3 Suitable means shall be provided to facilitate alarm testing without tripping the valve.

4.8.4 Means shall be provided to drain the pipe automatically between the alarm shut-off valve and the alarm device.

4.8.5 Differential-type valves shall be provided with a means of venting water from the intermediate chamber and also of preventing the build-up of a partial vacuum between the upstream and downstream sealing elements of the sealing assembly.