
Vgrajene naprave za gašenje – Sestavni deli sprinklerskih sistemov in sistemov s pršečo vodo – 9. del: Ventili za poplavne sisteme

(istoveten prEN 12259-9:2004)

Fixed firefighting systems - Components for sprinkler and water spray systems - Part 9: Deluge valve assemblies

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Fixed firefighting systems - Components for sprinkler and water spray systems - Part 9: Deluge valve assemblies

Installations fixes de lutte contre l'incendie - Organes constitutifs des systèmes sprinkleurs et à pulvérisation d'eau - Partie 9 : Blocs de soupape d'alarme déluage

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Sprinkler- und Sprühwasseranlagen - Teil 9: Sprühwasserventil und Zubehör

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 12259-9:2004) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

This document is part of the following series:

- gas extinguishing systems (EN 12094);
- sprinkler systems (EN 12259 and EN 12845);
- powder systems (EN 12416);
- explosion protection systems (EN 26184);
- foam systems (EN 13565);
- hose systems (EN 671);
- smoke and heat control systems (EN 12101).

EN 12259 will consist of the following:

- Part 1: Sprinklers;*
- Part 2: Wet alarm valve assemblies;*
- Part 3: Dry alarm valve assemblies;*
- Part 4: Water motor alarms;*
- Part 5: Water flow detectors;*
- Part 6: Pipe couplings;*
- Part 7: Pipe hangers;*
- Part 8: Pressure switches;*
- Part 9: Deluge alarm valve assemblies;*
- Part 10: Multiple controls;*
- Part 11: Medium and high velocity water sprayers;*
- Part 12: Pump sets.*

1 Scope

This part of EN 12259 specifies requirements for the construction and performance of deluge valve assemblies used in automatic water spray systems complying with EN 14816.

This European Standard does not cover elastomeric sleeve type valves.

With the exception of automatic drain valves, auxiliary components and attachments to deluge valve assemblies are not covered by this Part of EN 12259.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1 alarm device

mechanical or electrical device to sound an alarm on operation of the deluge valve

3.2 automatic drain (valve)

device, usually remaining open, which automatically drains water from the deluge valve

3.3 clapper

type of sealing assembly (see 3.19)

3.4 deluge system

automatic fire protection system using a deluge valve, which is operated by auxiliary means to admit water into a system of sprayers

3.5 deluge valve

water supply control valve intended to be operated by an auxiliary means to admit water into a system of piping with open sprayers

NOTE The auxiliary means of operating a deluge valve may be mechanical, electrical, hydraulic, pneumatic, thermal, manual or a combination of these.

3.6 dry pilot actuator

differential type valve which permits the operation of a hydraulically operated deluge valve upon loss of pneumatic pressure from a dry pilot line

3.7**dry pilot line**

pneumatic detection and actuation piping system fitted with heat responsive devices, usually sprinklers, which, when subjected to an abnormal source of heat, operate to release pressure from the piping system and dry pilot actuator, causing the automatic operation of a deluge valve

3.8**flow velocity**

water velocity through pipe of the same nominal size as the deluge valve at the same flow rate

3.9**hydraulically/pneumatically operated deluge valve**

valve, maintained in the set condition by service hydraulic/pneumatic pressure acting against a diaphragm or piston that holds the sealing assembly closed

NOTE A change in pressure against the diaphragm or piston allows the valve to open.

3.10**mechanically operated deluge valve**

deluge valve, maintained in the set position by mechanical means and released mechanically, e.g. by the action of a release weight

3.11**minimum service pressure**

lowest static water pressure required at the inlet to the deluge valve in the ready condition

3.12**nominal working pressure**

maximum service pressure (see 3.21) at which the deluge valve is intended to operate

3.13**priming water**

water to be provided at the outlet of the valve ready condition

3.14**supply-pressure operated deluge valve**

deluge valve, maintained in the set position by a spring or other means and hydraulically operated by the application of supply pressure to an auxiliary diaphragm or piston

3.15**ready (set) condition**

state of the deluge valve, fully assembled, with sealing assembly in the set position with the service pressure applied

3.16**reseating prevention**

avoidance of the sealing assembly returning to the closed position

3.17**resetting (valve)**

returning of the valve to the ready (set) condition

3.18**reinforced elastomeric element**

element of a clapper, clapper assembly or seat seals made of an elastomeric compound with one or more other components, which increases the tensile strength of the combination to at least twice that of the elastomeric material alone

3.19

sealing assembly

main movable sealing element of the deluge valve (e.g. clapper)

3.20

sealing assembly seat ring

main fixed sealing element of the deluge valve

3.21

service pressure

static water pressure at the inlet to the deluge valve in the ready condition

3.22

trim

external equipment and pipework, excluding the main installation pipework, fitted to the deluge valve assembly, as specified by the supplier

3.23

trip point

point at which the deluge valve operates, admitting water into the deluge system piping, measured in terms of the pilot line pressure and service pressure and expressed as a ratio

3.24

water motor alarm

hydraulically actuated alarm device (see 3.1) fitted to the deluge valve to provide a local audible alarm when the deluge system operates

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water motor transmitter

hydraulically actuated device to generate an electrical current to operate an electrical alarm device

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3.26

wet pilot line

hydraulic detection and actuation piping system fitted with heat responsive devices, usually automatic sprinklers, which, when subjected to an abnormal source of heat, operate to release pressure from the piping system, causing the automatic operation of a deluge valve

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4 Deluge valve assembly construction and performance

4.1 Nominal size

The nominal size shall be expressed as the nominal diameter of the inlet and outlet connections, i.e. the pipe size for which the connections are intended. The nominal size shall be DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200 or DN250.

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

4.2 Connections

4.2.1 Connections to the valve body

4.2.1.1 The dimensions of all connections to the assembly shall be specified by the deluge valve assembly supplier.

4.2.1.2 A connection shall be provided for the pilot line system for automatic and manual operation of the deluge valve.

4.2.2 Connections to the valve body or pipework

4.2.2.1 If priming water is required for sealing or damping purposes, external means shall be provided to allow priming water to enter.

4.2.2.2 Means shall be provided to facilitate testing of alarms without tripping the deluge valve.

4.3 Pressure and flow limits

The nominal working pressure shall be specified by the supplier and shall be not less than 12 bar.

NOTE Inlet and outlet connections may be machined for lower working pressure in order to match installation equipment of a lower working pressure.

The minimum service pressure shall be specified by the supplier and shall be not less than 1,4 bar.

The maximum allowable steady state flow shall be specified by the supplier.

4.4 Bodies and cover

4.4.1 Materials

The body and any cover shall be made of cast iron, bronze, brass, Monel metal, stainless steel or titanium or materials with equivalent physical and mechanical properties.

If non-metallic materials (other than for gaskets and pipe seals) or metals with melting point of less than 800 °C form part of the deluge valve body and any cover, the assembled deluge valve shall conform to 4.10.1 and the sealing assembly shall open freely and fully when tested in accordance with Annex A.

4.4.2 Configuration

The deluge valve cover plate (if fitted) shall not be assembled in a position which affects the operation of the valve so that it does not conform to this European Standard, in particular indication of flow direction, see 6.2 d).

4.4.3 Strength

4.4.3.1 The assembled deluge valve with the sealing assembly open shall withstand, without rupture, an internal hydrostatic pressure of four times the nominal working pressure, when tested in accordance with Annex B.

4.4.3.2 If the test described in Annex B is not performed on standard production fasteners, the supplier shall provide documentation showing, by calculation, that the normal design load of any fastener, excluding the force required to compress the gasket, does not exceed the minimum tensile strength specified in the appropriate standard (e.g. EN ISO 898-1 [1], ISO 898-2 [2]), when the deluge valve is pressurized to four times the nominal working pressure. The area of the application of pressure shall be calculated as follows:

- if a full-face gasket is used, the area of force application is that extending out to line defined by the inner edge of the bolts;
- if a toroidal sealing ring or ring gasket is used, the area of force application is that extending out to the centre line of the toroidal sealing ring or ring gasket.

4.5 Drains

4.5.1 The deluge valve body shall be provided with threaded connection in accordance with ISO 7-1 of at least 20 mm to drain water from the valve body downstream of the sealing assembly when the valve is installed in any position specified or recommended by the manufacturer.

NOTE Where the drain opening is also to be used for the draining of the installation pipework, the size of the threaded connection should conform to the appropriate value given in the installation standard.

4.5.2 An automatic or open drain shall be provided on the downstream side of the deluge valve to prevent water columning and to facilitate checking of priming water level.

4.5.3 Automatic or open drains shall have a k factor of not less than one.

4.5.4 Automatic flow or velocity type drain valves, used for venting or alarm line drainage, shall close at a pressure of not more than 1,4 bar with a flow rate through the drain valve just prior to closure of not less than 0,13 l/s and not more than 0,63 l/s when tested in accordance with C.1.

4.5.5 The flow through a permanently open-ended drain, used for venting or alarm line drainage shall not exceed 0,63 l/s at any service pressure up to the nominal working pressure when tested in accordance with C.2.

4.6 Sealing assembly and reseating prevention

4.6.1 Access

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

The design of any element that may normally be disassembled during servicing shall be such that it cannot be reassembled incorrectly without there being an external visual indication when the deluge valve is returned to service.

While the deluge valve is in the ready condition, the valve shall not easily be prevented from operating.

NOTE 1 Whatever means are provided should permit ready maintenance by one person with a minimum of downtime.

NOTE 2 With the exception of the valve seat, all parts intended for field replacement should be capable of being disassembled and reassembled with tools normally employed by the trade.

4.6.2 Springs and diaphragms

Springs and diaphragms shall not fracture or rupture during 5 000 cycles of normal operation when tested in accordance with D.1. Failure of diaphragms shall not prevent the sealing assembly from opening fully.

4.6.3 Resistance to damage

The sealing assembly shall bear against a definite stop in the fully open position. There shall be no sign of damage to the sealing elements of the deluge valve or any permanent twist, bend or fracture of any parts after testing in accordance with E.2.

4.6.4 Materials for seat rings and bearing surfaces

4.6.4.1 Seat rings shall be made of bronze, brass, Monel metal, titanium, stainless steel or materials with equivalent physical and mechanical properties.

4.6.4.2 The bearing surfaces of contacting parts that rotate or slide relative to each other shall be made of bronze, brass, Monel metal, titanium or stainless steel or materials with equivalent physical and mechanical properties.

NOTE Bushings or inserts may be used.

4.6.5 Reseating prevention

Deluge valves shall be provided with a device which prevents the valve from reseating until manually reset where:

- a) the ratio of service pressure to installation pressure, at the point where the tripped valve reopens exceeds 1,16 to 1, for service pressures between the minimum service pressure and the nominal working pressure; or
- b) the installation drain is located upstream of the sealing assembly.

Deluge valves having a latch for the prevention of resetting shall be tested in accordance with D.2 and E.2, without sustaining permanent distortion, cracks, delamination or other signs of failure.

Valves which are not equipped with a device which prevents the valve from reseating, and for which the ratio of service pressure to installation pressure is unknown or estimated to be greater than 0.8 to 1, shall be tested in accordance with D.3 to determine that the ratio of service pressure to installation pressure.

NOTE The supplier may provide details of the deluge valve estimated ratio of service pressure to installation pressure by submitting test evidence or calculations.

4.7 Non-metallic components (excluding gaskets, diaphragms and seals)

After ageing non-metallic components in accordance with Annex F, there shall be no cracking of any component and the deluge valve shall meet the requirements of 4.13 and 4.14 when tested in accordance with Annex G, and Annex

4.8 Sealing assembly and diaphragm elements

4.8.1 There shall be no leakage of water when the deluge valve assembly is tested in accordance with E.2.

NOTE Valve sealing surfaces should withstand ordinary wear and tear, rough usage, compression stresses and damage due to pipe scale or foreign matter carried by the water.

4.8.2 A seal of elastomer or other resilient materials shall not adhere to the mating surface when tested in accordance with H.1.

4.9 Clearances

NOTE Clearances are necessary between moving parts and between moving and stationary parts so that corrosion or deposits of foreign matter within an assembly will not render the deluge valve sluggish in action or inoperative.

4.9.1 Except for sealing assembly hinge boss areas, the radial clearance [see Figure 1 a)] between the sealing assembly and the inside walls of the body (excluding moving catches and latching mechanisms) in every position except the wide open position, shall be not less than 19 mm if the body is cast iron or 9 mm if both the body and sealing assembly are of non-ferrous metal, stainless steel, material of equivalent performance or a combination of these.

For any sealing assembly hinge boss areas, the radial clearances shall be not less than 12 mm for a cast iron body or 6 mm, if body and sealing assembly are of non-ferrous metal, stainless steel, material of equivalent performance or a combination of these.

4.9.2 There shall be diametrical clearance [see Figure 1 b)], of not less than 3 mm between the inner edges of the seat ring and the metal parts of the sealing assembly when in the closed position.

4.9.3 Any space in which the sealing assembly may trap debris below the valve seat shall be not less than 3 mm deep.

4.9.4 The diametrical clearance [(see Figure 1 b)] between any pins and their bearings shall be not less than 0,125 mm.

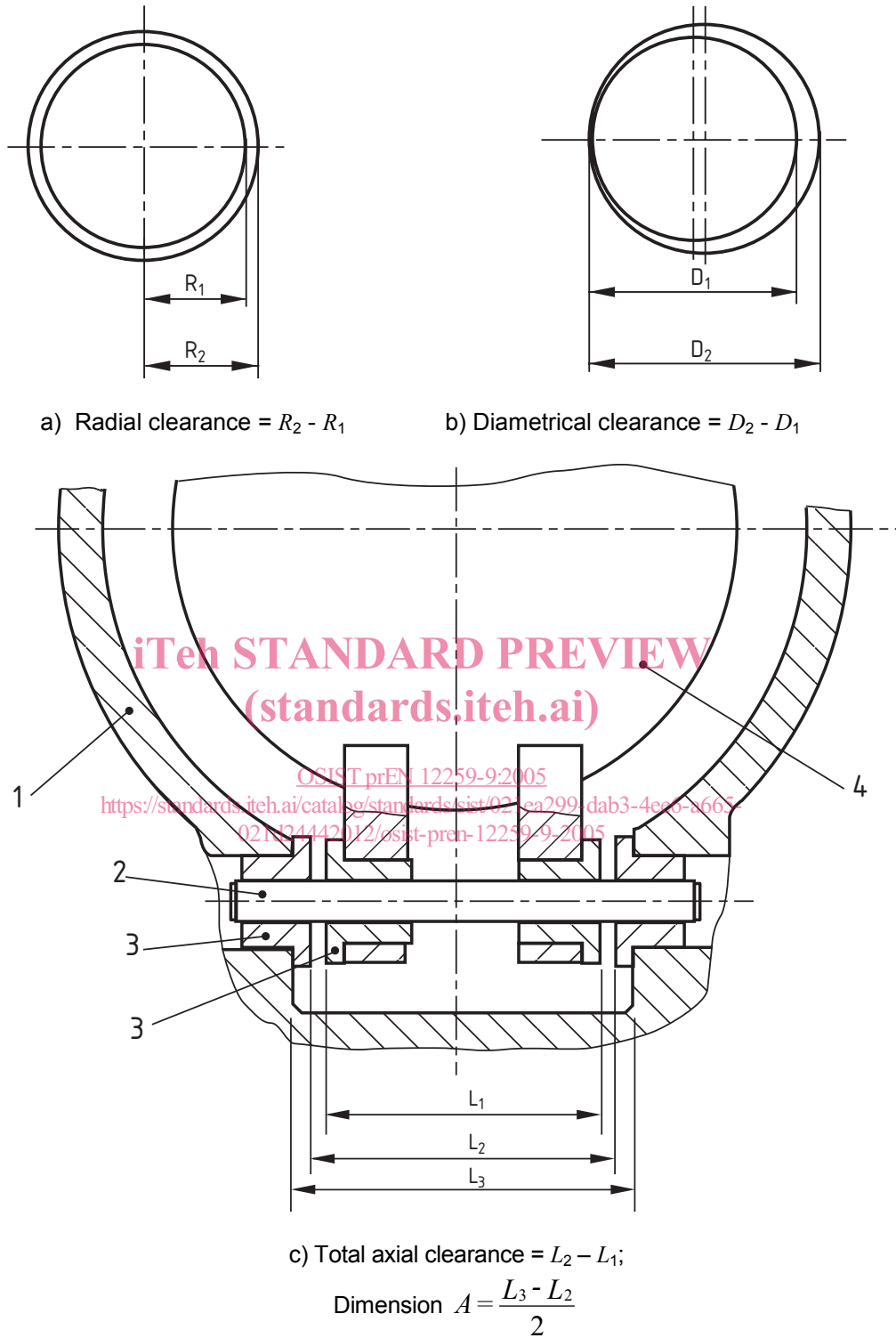
4.9.5 The total axial clearance [see Figure 1 c)] between any clapper hinge and the adjacent deluge valve body bearing surfaces shall be not less than 0,25 mm.

4.9.6 Any reciprocating guide components in the main valve body, operation of which is essential to allow the deluge valve to open, shall have minimum diametrical clearance of not less than 0,7 mm in that portion over which the moving component enters the fixed component and of not less than 0,1 mm in that portion of the moving component continuously in contact with the fixed component in the ready condition.

4.9.7 Any sealing assembly, lever assembly, latch or hinge pin bearings or bushings shall project sufficient axial distance to maintain dimension A [see Figure 1 c)] at not less than 3 mm if the adjacent parts are not of bronze, brass, Monel metal, stainless steel or equivalent material.

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- Key**
- 1 Valve body
 - 2 Pin
 - 3 Bushings
 - 4 Clapper

Figure 1 — Clearances