

UL 260

Dry Pipe and Deluge Valves for Fire-Protection Service

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UL Standard for Safety for Dry Pipe and Deluge Valves for Fire-Protection Service, UL 260

Seventh Edition, Dated March 17, 2004

Revisions: This Standard contains revisions through and including July 6, 2007.

Summary of Topics

This revision of ANSI/UL 260 is being issued to 1) add clarification of scope requirements; 2) add revisions to the glossary; 3) clarify intermediate chamber automatic drain valve requirements; 4) revise bodies and covers requirements; 5) delete duplicate section for Priming Water, Section 17; 6) revise the Hydraulic Friction Loss Test; and 7) add Appendix B for Valve Mechanisms.

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Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revisions dated July 6, 2007 include a reprinted title page (page1) for this Standard.

The new and/or revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated March 9, 2007.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

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B1-B6	July 6, 2007
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CRG3-CRG4	March 17, 2004

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ANSI/UL 260-2007

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UL 260

Standard for Dry Pipe and Deluge Valves for Fire-Protection Service

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March 17, 2004

The most recent designation of ANSI/UL 260 as an American National Standard (ANSI) occurred on July 6, 2007. The ANSI approval for this standard does not include the Canadian Requirements Comparison Guide (CRG).

This ANSI/UL Standard for Safety, which consists of the Seventh Edition with revisions through July 6, 2007 is under continuous maintenance, whereby each revision is ANSI approved upon publication.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc. and is not part of the ANSI standard.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover valve equipment intended for installation in piping systems to supply water automatically to dry pipe, deluge, and preaction sprinkler systems for fire-protection service.

1.2 Valves covered by these requirements may be a differential type, latched-clapper type, low-differential type, or a combination of these types.

1.3 The valves covered by these requirements are intended for installation and use in accordance with the following standards:

- a) Standard for Low-, Medium-, and High-Expansion Foam, NFPA 11.
- b) Standard for the Installation of Sprinkler Systems, NFPA 13.
- c) Standard for the Installation of Standpipe and Hose Systems, NFPA 14.
- d) Standard for Water Spray Fixed Systems for Fire Protection, NFPA 15
- e) Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems, NFPA 16

1.3 revised July 6, 2007

2 Components

2.1 Auxiliary components or attachments to valves, such as water-motor-driven alarm gongs, electric circuit closers, pressure-operated switches, pressure gauges, and the like, shall comply with the requirements for such devices or products and also with respect to the particular application. See Standard for Alarm Accessories for Automatic Water-Supply Control Valves for Fire Protection Service, UL 753, and Standard for Indicating Pressure Gauges for Fire Protection Service, UL 393. Also see 2.2 – 2.5.

2.2 Except as indicated in 2.3, a component of a product covered by this standard shall comply with the requirements for that component.

2.3 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

2.4 A component shall be used in accordance with its rating established for the intended conditions of use.

2.5 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Glossary

5.1 For the purpose of this standard the following definitions apply.

5.2 ALARM DEVICE – A mechanical or electrical device to sound an alarm on operation of the valve.

5.3 AUTOMATIC DRAIN VALVE – A valve connected in the open position to the intermediate chamber of a dry pipe valve so as to drain water from the chamber and vent the chamber to atmosphere when the valve is in the set position, and limits water flow from the chamber after the valve is tripped.

5.3 revised July 6, 2007

5.4 CLAPPER – That portion of a valve mechanism on which air pressure or water pressure, or both, act and which opens to allow water to flow through the valve when operated.

5.5 DELUGE VALVE – An automatic water-supply control valve that is intended to be operated by:

- a) Mechanical, electrical, hydraulic, pneumatic, or a thermal fire detection system installed in the same area as sprinklers;
- b) Manual means; or
- c) A combination of these methods.

A deluge valve is intended to admit water into:

- a) A piping system having open sprinklers (deluge systems); or
- b) A piping system with closed sprinklers (preaction systems).

5.5 revised July 6, 2007

5.6 DIFFERENTIAL – The ratio of system water supply pressure to system air pressure, expressed as gauge pressures measured at the trip point.

5.7 DIFFERENTIAL DRY PIPE VALVE – A dry pipe valve having an air clapper of large diameter relative to the diameter of the water clapper with the two separated by an intermediate chamber maintained at atmospheric pressure.

5.8 DRY PIPE VALVE – An automatic sprinkler water-supply control valve constructed so that air pressure in a system of piping will retain water pressure and flow until the air pressure in the system is released by actuation of an automatic sprinkler, manual release, or other similar devices.

5.8 revised July 6, 2007

5.9 INTERMEDIATE CHAMBER – That portion of a differential or low-differential dry pipe valve which separates the air and/or water clapper seating surfaces and that is at atmospheric pressure when the valve is in the set position.

5.10 LATCH, ANTI-RESEAT – A latch mechanism provided in a differential dry pipe valve designed to prevent the clapper from returning to its set position after operation.

5.11 LATCHED-CLAPPER TYPE VALVE – A valve in which a mechanism acts to produce a force which is multiplied through a series of levers, links, or latches to maintain the water clapper in the closed position. Such a valve is sometimes referred to as a mechanical type.

5.12 LEAK POINT – The system air pressure and service water pressure at which water begins to emit from the intermediate chamber drain during the tripping sequence of a valve.

5.13 LOW-DIFFERENTIAL DRY PIPE VALVE – A dry pipe valve having a single clapper member whose effective area exposed to system air pressure is only slightly larger than the effective area exposed to supply water pressure. Such a valve has a differential of 1.5:1 or lower.

5.14 PILOT SPRINKLER – An automatic sprinkler connected to an air or water line, which in turn is connected to a deluge, preaction, or other water-supply control valve; when actuated, the sprinkler will cause the valve to operate.

5.15 PRIMING CONNECTION – A port provided in the valve body to allow water to enter above the clapper when the valve is in the set position.

5.16 SET POSITION – The position of a valve clapper and other operating parts with system pressure and system air pressure applied when the valve is ready for operation.

5.16 revised July 6, 2007

5.16.1 SYSTEM PRESSURE – The static water pressure at the main outlet of a valve when the valve is in the set condition.

5.16.1 added July 6, 2007

5.16.2 SYSTEM AIR PRESSURE – The static air pressure in the system piping when the valve is in the set condition.

5.16.2 added July 6, 2007

5.17 TRIP POINT – That system air pressure and service water pressure at which the valve clapper begins to move away from the set position to allow water to flow into the system.

5.18 TRIPPING DEVICE – A device for operating a dry pipe or deluge valve, initiated by a fire detection system or by manual means.

5.19 VALVE GAG – Any supplementary means which prevents normal operation.

5.20 WATER COLUMNING – A condition occurring in a dry, deluge, or preaction fire suppression system where water accumulates downstream of the clapper of a system control valve, preventing the control valve from operating.

5.21 WATER-MOTOR OPERATED ALARM – A mechanical alarm device (operated by energy or water flow) attached to a dry pipe, preaction, or deluge valve and supplied with water from the intermediate chamber or discharge side of the valve, to sound an alarm on operation of the valve.

5.22 WET PILOT SPRINKLER LINE – A hydraulic detection and actuation piping system equipped with heat responsive devices, commonly automatic sprinklers which when subjected to heat from a fire, operate to release water pressure from the piping system causing the automatic operation of a deluge valve.

5.22 added July 6, 2007

CONSTRUCTION

6 Sizes

6.1 Valves covered by these requirements include sizes 1 – 12 inches (25.4 – 305 mm), inclusive.

6.2 Valve sizes refer to the nominal diameter of the waterway through the inlet and outlet connections and to the pipe size for which the connections are intended. The diameter of the waterway through the water seat ring of the valve may be reduced below that of the waterway through the inlet and outlet connections.

7 Rated Pressure

7.1 A valve shall be constructed for a minimum rated pressure of 175 psig (1206 kPa). A low differential dry pipe valve shall have a maximum rated pressure of 175 psig (1206 kPa).

8 Operating Mechanisms

8.1 Differential type dry pipe valves

8.1.1 A differential dry pipe valve shall have a differential within the range of 4.5:1 and 11:1 for all service pressures between 20 psig (138 kPa) and the maximum rated pressure. The difference between the maximum and minimum values of the differential, as determined during tests of any individual valve, shall not exceed 3.5.

8.1.2 A low-differential dry pipe valve for use only with designated attachments, components, or trim shall have a differential within the ratio of 1:1 and 1.5:1 for all sizes of valves and for all service pressures from 20 to 175 psig (138 to 1206 kPa).

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8.2 Latched-clapper type dry pipe valves

8.2.1 The minimum system air pressure at which a latched-clapper type dry pipe valve will trip shall be at a value to provide for positive operation under any condition. The minimum air pressure causing the valve to trip shall be 15 psig (103 kPa) at 150 psig (1034 kPa) service pressure.

8.2.2 A latched-clapper dry pipe valve shall be either:

- a) Constructed to reduce the likelihood of water leakage from the water side of the valve to the air side when in the set position; or
- b) Provided with a positive means of venting any leakage of water from the space above the clapper.

8.3 Deluge valves

8.3.1 A deluge valve shall be operable by automatic and manual means. The valve shall be arranged for attachment of both types of operating means.

8.3.2 An automatic operating means of the electric type shall be constructed for operation from both a primary and a secondary source of electric energy.

9 Bodies and Covers

9.1 The body and cover of a valve shall be made of material having corrosion resistance at least equivalent to cast iron. If nonmetallic materials are used, they are to be judged on the basis of their ability to resist external fire exposure and thermal shock.

9.2 A casting shall not be plugged or filled, but may be impregnated to remove porosity.

9.3 The dimensions of all flanges, flange pipe joints, and threaded body openings shall conform to the following standards, as applicable or to other national standards that apply where the valve is intended to be installed:

- a) Dryseal Pipe Threads (Inch), ANSI B1.20.3.
- b) Pipe Threads, General Purpose (Inch), ANSI/ASME B1.20.1.
- c) Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, and 250, ANSI/ASME B16.1.
- d) Steel Pipe Flanges for Waterworks Service – Sizes 4 in. Through 144 in. (100 mm Through 3,600 mm), ANSI/AWWA C207. Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch, ANSI/ASME B16.5, for valves having a maximum rated pressure greater than 175 psig (1206 kPa).
- e) Grooved and Shouldered Joints, ANSI/AWWA C606.

9.3 revised July 6, 2007

9.4 Provision shall be made in a valve body for connection of all external fittings and attachments specified by the Standard for the Installation of Sprinkler Systems, ANSI/NFPA 13.

9.5 The point of connection of alarm piping to a valve shall be such that pressure sufficient to operate alarms is available at any flow rate through the valve from 1 to 20 feet per second (0.3 – 6 m/s), with a residual pressure at the valve of 15 psig (103 kPa).

9.6 A tapped opening in a valve body for main drain connection shall be at least 3/4-inch pipe size for up to 2-inch valves, at least 1-1/4-inch pipe size for 2-1/2 to 3-1/2 inch valves, and 2-inch pipe size for 4-inch and larger valves.

9.7 A tapped opening provided for main drain piping shall be located on the water-supply side of the valve clapper. For a low-differential dry pipe valve, an additional tapped opening for system drain piping shall be provided on the system side of the clapper.

9.8 A body handhole opening shall be provided and shall be sufficiently large to permit access to all working parts and to allow the removal of the clapper assembly.

Exception: A valve is not required to be provided with a body handhole opening when all of the following criteria are met:

- a) The valve is designed to permit the clapper and all other internal operating parts to be removed and replaced;*
- b) A means is provided to allow removal and reinstallation of the valve, or serviceable portion of the valve, without disassembly of the sprinkler system piping; and*
- c) The means for valve or part removal and reinstallation is integral with the valve.*

9.9 If a body handhole opening is provided, a cover plate shall be attached to the body of a valve using bolts and nuts, or bolts alone.

9.10 Bolts, nuts, and studs employed for the bolting of pressure-holding castings shall comply with the applicable requirements in the Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength, ASTM A307; and in the Standard Specification for Carbon and Alloy Steel Nuts, ASTM A563. Bolts shall be Grade A or Grade B, as specified in ASTM A307.

9.11 The load on any bolt, exclusive of the force to compress the gasket, shall not exceed the minimum tensile strength specified in Table 2 of the Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength, ASTM A307, when the valve is pressurized to five times the rated pressure for 6-inch size (152-mm) or smaller valves and to four times the rated pressure for 8-inch (203-mm) or larger size valves. The area of the application of pressure is to be calculated as follows:

- a) If a full-face gasket is used, the area of force 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 force application is that extending out to the center line of the "O" ring or gasket.