



Member of the FM Global Group

Approval Standard for Quick Opening Devices (Accelerators, Exhausters) for Dry Pipe Valves

Class Number 1031

August 2019

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Foreword

The FM Approvals certification mark is intended to verify that the products and services described will meet FM Approvals' stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and listing depends on compliance with the Approval Agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility.

FM Approvals LLC reserves the right in its sole judgment to change or revise its standards, criteria, methods, or procedures.

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1. INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states Approval requirements for quick opening devices (accelerators and exhausters) used with dry pipe valves in dry automatic sprinkler fire protection systems to hasten the operation of dry pipe valves when one or more sprinklers operate. These devices are also used on preaction sprinkler systems to hasten the operation of automatic water control valves. This standard addressed both mechanical and electronic devices.
- 1.1.2 Approval criteria may include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

1.2 Scope

- 1.2.1 This standard encompasses the design and performance requirements for quick opening devices (accelerators and exhausters) for use in dry automatic sprinkler fire protection systems.
- 1.2.2 Approval standards are intended to verify that the product described will meet stated conditions of performance, safety, and quality useful to the ends of property conservation.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing, and/or the standards of other organizations. The advice of manufacturers, users, trade associations, jurisdictions and/or loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of Quick Opening Devices (Accelerators and Exhausters) for use in dry pipe automatic sprinkler fire protection systems having characteristics not anticipated by this standard may be FM Approved if performance equal, or superior, to that required by this standard is demonstrated, or if the intent of the standard is met. Alternatively, Quick Opening Devices (Accelerators and Exhausters) for use in dry pipe automatic sprinkler fire protection systems which meet all the requirements identified in this standard may not be FM Approved if other conditions that adversely affect performance exist or if the intent of this standard is not met.

1.4 Basis for Approval

Approval is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:

- 1.4.1 Examination and tests on production samples shall be performed to evaluate:
- Suitability of the product;
 - Performance of the product as specified by the manufacturer and required by FM Approvals; and, as far as practical,
 - Durability and reliability of the product.
- 1.4.2 An initial Surveillance Audit shall be conducted to evaluate the manufacturer's ability to consistently produce the product that was examined and tested as part of the Approval project. The audit shall review the facility and in-place quality control procedures used in the manufacturing of the product. Typically, areas of review are incoming inspection, work in progress, production testing, final quality control, marking, calibration of equipment, shipping procedures, and document and drawing control. These examinations are repeated periodically as part of FM Approvals' product follow-up program. (Refer to Section 5.2, Surveillance Audit.)

1.5 Basis for Continued Approval

1.5.1 Continued Approval is based upon:

- Production or availability of the product as currently FM Approved;
- The continued use of acceptable quality assurance procedures;
- Satisfactory field experience;
- Compliance with the terms stipulated in the Master Agreement;
- Satisfactory re-examination of production samples for continued conformity to requirements; and
- Satisfactory Surveillance Audits conducted as part of FM Approvals' product follow-up program.

1.5.2 Also, as a condition of retaining Approval, manufacturers shall not change a product or service without prior authorization by FM Approvals.

1.6 Effective Date

The effective date of an Approval Standard mandates that all products tested for Approval after the effective date shall satisfy the requirements of that standard. Products FM Approved under a previous edition shall comply with the new version by the effective date or forfeit Approval.

The effective date of this standard is August 1, 2019 for full compliance with all requirements.

1.7 System of Units

Units of measurements used in this standard are United States (U.S.) Customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Appendix A lists the selected units and conversions to SI units for measures appearing in this standard. Conversion of U.S. customary units is in accordance with the American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)/American Society for Testing Materials (ASTM) SI 10, *American National Standard for Metric Practice*.

1.8 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

ANSI/IEEE/ASTM SI 10, *American National Standard for Metric Practice*

ANSI/ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*.

International Organization for Standardization, ISO 17025, *General requirements for the competence of testing and calibration laboratories*

1.9 Definitions

For purposes of this standard, the following terms apply:

Accelerator

An accelerator is installed as part of the valve trim on a dry-pipe valve installed on the riser of a dry-pipe sprinkler system. It is used to reduce the time it takes a dry-pipe valve to open. It operates (trips) by sensing a significant and steady drop in system pressure (caused by the actuation of one or more sprinklers) which redirects system pressure to the intermediate chamber of the dry pipe valve reducing the pressure differential across the clapper of the dry-pipe valve allowing it open. Accelerators may be mechanical type or electric/electronic type.

Accepted

This term refers to installations acceptable to the authority enforcing the applicable installation rules. When the authority is FM Global, such locations are termed “FM Global Accepted.” Acceptance is based upon an overall evaluation of the installation. Factors other than the use of FM Approved equipment impact upon the decision to accept, or not to accept. Acceptance is not a characteristic of a product. It is installation specific. A product accepted for one installation may not be acceptable elsewhere. (Contrast with FM Approved.)

Automatic Sprinkler System

An integrated network of above-ground piping to which automatic sprinklers are attached. As a minimum, each sprinkler system is provided with at least one system control valve, system pressure gauge, system drain valve and a means of initiating alarm notification in the event of water movement through the system’s piping network. A sprinkler system is considered to provide adequate protection when it is connected to a reliable water supply that can provide the flow, pressure and duration requirements for all occupancy hazards protected by the sprinkler system as required.

Automatic Drain Valve

An automatic drain valve, also referred to as a ball drip check or velocity check valve, is used to ensure the intermediate chamber of a differential dry-pipe remains unpressurized while the valve is in the ready or set position. When the dry pipe valve trips the automatic drain valve trips allowing pressure to rise within the intermediate chamber.

Dry Pipe Automatic Sprinkler System

An automatic sprinkler system that is located downstream of a dry-pipe valve. It is filled with a pressurized gaseous medium (typically air or an inert gas such as nitrogen) for the purpose of maintaining the dry-pipe valve in the closed position. Upon sprinkler actuation, the pressure within the sprinkler system begins to drop until the pressure becomes too low to keep the dry-pipe valve closed. At this time the dry-pipe valve opens (trips) allowing water to fill the sprinkler system and discharge through any automatic sprinkler that has been actuated. A dry-pipe sprinkler system is typically used in areas where the presence of water within the sprinkler is not suitable. These systems are used when the ambient temperature of the protected area can drop below 40°F (4°C) or rise above 200°F (95°C).

Dry-Pipe Valve

An automatic water control valve, typically installed on the riser of a sprinkler system, which is specifically designed to use a pressurized gaseous medium (typically air or an inert gas such as nitrogen) to hold back water on the upstream side of the valve. The valve remains closed until the gas pressure on the downstream side of the valve drops, such as by automatic sprinkler operation, to a value too low to hold back the pressure of the water, thus opening the valve and allowing water to flow into and fill up the dry-pipe sprinkler system. Similar to an alarm check valve, it is designed to be equipped with a means of alarm notification in the event water flows through it, but it is also equipped with a means of measuring the gas pressure within the sprinkler system. There are two types of dry-pipe valves available, a differential type valve and a mechanical type valve which are further described below.