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Examination Standard for Pressure Maintenance Devices

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Foreword

This standard is intended to verify that the products and services described will meet stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of this standard is to present the criteria for examination of various types of products and services.

Examination in accordance with this standard shall demonstrate compliance and verify that quality control in manufacturing shall ensure a consistent and reliable product.

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1 INTRODUCTION

1.1 Purpose

1.1.1 This standard states testing and certification requirements for pressure maintenance devices (air/nitrogen) used in dry pipe and preaction type automatic sprinkler fire protection systems to automatically maintain, within pre-set limits, the air/nitrogen pressure within these systems.

1.1.2 Testing and certification criteria may include performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a surveillance program.

1.2 Scope

1.2.1 This standard encompasses the design and performance requirements for pressure maintenance devices (air/nitrogen) for use in dry pipe and preaction fire protection systems.

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 may also be considered.

1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of pressure maintenance devices (air/nitrogen) for use in dry pipe and preaction fire protection systems for the purpose of obtaining certification.

1.4 Basis for Certification

Certification 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:

- the suitability of the product;
- the performance of the product as specified by the manufacturer and required for certification;
- the durability and reliability of the product.

1.4.2 An examination of the manufacturing facilities and audit of quality control procedures may be conducted to evaluate the manufacturer's ability to consistently produce the product which is examined and tested, and the marking procedures used to identify the product. Subsequent surveillance may be required by the certification agency in accordance with the certification scheme to ensure ongoing compliance.

1.5 Basis for Continued Certification

The basis for continual certification may include the following based upon the certification scheme and requirements of the certification agency:

- production or availability of the product as currently certified;
- the continued use of acceptable quality assurance procedures;

- compliance with the terms stipulated by the certification;
- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory surveillance audits conducted as part of the certification agency's product surveillance program.

1.6 Effective Date

The effective date of this examination standard mandates that all products tested for certification after the effective date shall satisfy the requirements of this standard.

The effective date of this standard is eighteen (18) months after the publication date of the standard for compliance with all requirements.

1.7 System of Units

Units of measurement 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. Conversion of U.S. customary units is in accordance with ANSI/IEEE/ASTM SI 10.

Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection and are used in this standard.

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.

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

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

1.9 Terms and 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. Acceptance is based upon an overall evaluation of the installation. Acceptance is not a characteristic of a product. It is installation specific. A product accepted for one installation may not be acceptable elsewhere.

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 automatic water supply that can provide the flow, pressure and duration requirements for all occupancy hazards protected by the sprinkler system.

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 valve 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.

Differential Type Dry-Pipe Valve

A dry pipe valve that is held in the closed position by a clapper that is characterized by a larger system (air/nitrogen) surface area than the surface area of the clapper in contact with water on the supply side of the valve. Normally these valves are designed with a pressure differential of between 5.0 and 6.5. As a result, in a valve with a differential of 5.0, a 20 psi (1.4 bar) system air/nitrogen pressure would be necessary to equalize a water supply pressure of 100 psi (6.9 bar). An additional 20 psi (1.4 bar) of system air/nitrogen pressure is typically supplied to ensure the valve will remain closed and avoid false trips. These valves employ an intermediate chamber which is normally vented to atmosphere so that the differential is maintained ensuring the valve remains closed. To hasten operation of the differential type dry-pipe valve an accelerator may be installed in the valve trim which, when activated, would redirect system air/nitrogen pressure into the intermediate chamber. This redirected pressure destroys the pressure differential of the valve, allowing it to trip sending water into the system piping.

Mechanical Type Dry-Pipe Valve

A dry pipe valve that is held in the closed position by a mechanical latch or piston. The operation of this type of valve is independent of water pressure and relies on an external device, a dry pilot actuator, provided as part of the valve trim. The dry pilot actuator functions similar to the differential valve described above. When the dry pilot actuator trips it vents the priming chamber of the mechanical type

dry pipe valve allowing the aforementioned latch or piston to retrack allowing the valve to trip sending water into the system piping.

Exhauster

An exhauster is typically installed as part of the valve trim on the dry-pipe valve installed on the riser of a dry-pipe sprinkler system. Larger exhausters may also be installed in system piping. Regardless of its installation location, 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 vents system air/nitrogen pressure to atmosphere. This venting speeds the pressure decay of the sprinkler system reducing the pressure differential across the clapper of the dry-pipe valve allowing it open quicker than would be the case if venting was only accomplished through open sprinklers.

End Connections

The means by which components of a sprinkler system are connected to the sprinkler fitting or piping. Typical end connections for pressure maintenance devices are threaded.

Intermediate Chamber

A portion of a differential dry pipe valve which is open to atmosphere during normal operation. It remains open to atmosphere by use of an automatic drain valve when the valve is in its normally shut or "set" position. When supplied with system air/nitrogen through the activation of an accelerator, the automatic drain valve closes, allowing pressure in the intermediate chamber to rise and destroy the differential of the differential dry pipe valve, allowing it to trip sending water into the system piping.

Pressure Maintenance Device

A pneumatic/nitrogen pressure maintenance device used to automatically maintain the correct pneumatic/nitrogen pressure in a dry pipe sprinkler system, preaction system, or in dry pilot lines. When installed in these systems, this device eliminates the need for manual filling to overcome small leaks or temperature changes. Pressure maintenance devices do not interfere with the operation of a dry pipe or deluge valve including those used with quick opening devices.

Preaction System, Single-Interlock

A sprinkler system employing automatic sprinklers attached to a piping system containing supervisory pressure with a supplemental detection system installed in the same areas as the sprinklers. Actuation of the detection system signals a fire alarm control system which opens the automatic water control valve which permits water to flow into the sprinkler piping system and to be discharged from any sprinklers that are open.

Single-Interlock preaction systems are used where it is important to prevent the accidental discharge of water. These systems may also be used where an alarm is desired in advance of sprinkler operation or where it is desired to minimize the water delivery delay inherent in a standard dry-pipe system.

Preaction System, Double-Interlock (Also referred to as a Refrigerated Area System)

A sprinkler system employing automatic sprinklers in the system piping which contains supervisory pressure. Installed in the area of the system sprinklers are detectors/releasing devices, which are either electric heat (or smoke) detectors or pneumatic release detectors such as a fixed temperature sprinkler head in a dry pilot line. This arrangement requires two independent detector/releasing activations in order to trip the automatic water control valve and flow water into the sprinkler piping. This system provides an additional safeguard against accidental water discharge than that of single-interlock preaction systems. The system is also referred to as a ***refrigerated area system*** because they are predominately installed in refrigerated areas where the accidental charging of the distribution lines with water could have detrimental effects on the installation.

In contrast, the single-interlock preaction system would fill the system piping with water upon one detector

activation only. This would result in frozen sprinklers and piping without an activated sprinkler. The sprinkler system would have to be dismantled, resulting in a prolonged time without fire protection.

However, these double-interlock systems are also employed in sensitive non-freezer applications where the accidental water discharge would cause damage and production downtime of expensive equipment, such as found in semi-conductor manufacturing.

Pressure Regulator

A control valve used to automatically reduce and maintain outlet pressure below that of a source inlet pressure.

Pressure Switch

A switch that closes an electrical contact when a desired pressure has been observed at its inlet. The switch may make contact either on pressure rise or decrease.

Rated Working Pressure

This is the maximum sustained pressure at or below which the air pressure maintenance device shall operate trouble free. This also sets the basis for the testing described in Section 4, Performance Requirements. The minimum pressure rating considered for certification is 175 psi (12.06 bar).

2. GENERAL INFORMATION

2.1 Product Information

2.1.1 Pressure maintenance devices are used to control and maintain the required air/nitrogen pressure necessary to keep the differential dry pipe valve closed in a dry pipe sprinkler system. The air or nitrogen pressure in a dry pipe sprinkler system is normally supplied by an air compressor or nitrogen cylinders (with pressure regulator) or nitrogen generators. The compressed air/nitrogen is automatically maintained by the pressure maintenance device which contains a pressure sensing element and flow control valve which regulates air/nitrogen flow into the dry pipe or preaction sprinkler system. The pressure sensing element is the control medium that maintains the air pressure within predetermined limits. The flow control valve permits air to pass from the supply source to the sprinkler system upon receipt of a signal from the sensing element. Per NFPA 13, a pressure maintenance device is required where the air compressor supplying the dry pipe system has a capacity equal to or greater than 5.5 ft^3/min (160 L/min) at 10 psi (0.7 bar).

2.1.2 In order to meet the intent of this standard, all pressure maintenance devices must be examined on a model-by-model, type-by-type, manufacturer-by-manufacturer, and plant-by-plant basis. This is predicated on the basis that identical designs, fabricated in identical materials by different manufacturer or, even by different plants of the same manufacturer, have been seen to perform differently in testing. Sample pressure maintenance devices, selected in conformance to this criterion, shall satisfy all of the requirements of this standard.

2.2 Certification Application Requirements

The manufacturer shall provide the following preliminary information with any request for certification consideration:

- a complete list of all models, types, sizes, and options for the products or services being submitted for certification consideration,
- general assembly drawings, and one complete set of manufacturing drawings, materials list(s), anticipated marking format, brochures, sales literature, specification sheets, installation, operation and maintenance procedures, and
- the number and location of manufacturing facilities.

All documents shall identify the manufacturer's name, document number or other form of reference, title, date of last revision, and revision level. All foreign language documents shall be provided with English translation.

2.3 Requirements for Samples for Examination

2.3.1 Following set-up and authorization of a certification examination, the manufacturer shall submit samples for examination and testing based on the following:

- Sample requirements are to be determined by the certification agency

2.3.2 Requirements for samples may vary depending on design features, results of prior or similar testing, and results of any foregoing tests.

2.3.3 The manufacturer shall submit samples representative of production.

2.3.4 It is the manufacturer’s responsibility to provide any special test fixtures such as those that may be required to evaluate the pressure maintenance devices.

3. GENERAL REQUIREMENTS

3.1 Review of Documentation

3.1.1 During the initial investigation and prior to physical testing, the manufacturer's specifications, technical data sheets, and design details shall be reviewed to assess the ease and practicality of installation and use. The product shall be capable of being used within the limits of the final certification.

3.1.2 The manufacturer's dimensional specifications and/or design drawings shall fully describe the product. All critical dimensions shall be indicated with the allowed upper and lower tolerance limits clearly shown.

3.2 Physical or Structural Features

3.2.1 The pressure maintenance device shall be designed for a minimum rated working pressure of 175 psi (12.06 bar).

3.2.2 Pressure maintenance devices consist of a pressure sensing element, either a pressure regulator or pressure switch. The pressure regulator reduces higher pressure air/nitrogen to a level required by the dry pipe or preaction sprinkler system while the pressure switch will activate (and deactivate) an air compressor within predetermined limits to provide pressurized air to these systems.

3.2.3 The inlet of the pressure maintenance device shall be supplied with a threaded end connection. This connection shall conform to a recognized national or international standard, such as ANSI/ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*.

3.2.4 Pressure maintenance devices shall include the following components:

- a by-pass line which allows air/nitrogen to be introduced to the sprinkler system piping during initial pressurization with no pressure regulation.
- a suitable strainer shall be provided to protect the small opening(s) in the air pressure maintenance device.
- a check valve furnished to protect the regulator from water entry once dry pipe or deluge valve has tripped.
- shut off valve(s) to isolate the pressure maintenance device for repairs, etc.

3.3 Materials

All materials used in the construction of the pressure maintenance device shall be suitable for the intended application. Parts exposed to water shall be constructed of corrosion resistant materials. Materials shall be compatible with other sprinkler system components. When unusual materials are used, special tests may be necessary to verify their suitability. All components shall withstand the normal abuse of shipping, handling, and installation.

3.4 Markings

3.4.1 Marking on the product or, if not possible due to size, on its packaging or label accompanying the product, shall include the following information:

- name and address of the manufacturer or marking traceable to the manufacturer;
- date of manufacture or code traceable to date of manufacture or lot identification;

- model number, air flow directional arrow, etc., as appropriate.

When hazard warnings are needed, the markings should be universally recognizable

3.4.2 The model or type identification shall correspond with the manufacturer's catalog designation and shall uniquely identify the certification agency's mark of conformity.

3.4.3 The certification agency's mark of conformity shall be displayed visibly and permanently on the product and/or packaging as appropriate and in accordance with the requirements of the certification agency. The manufacturer shall exercise control of this mark as specified by the certification agency and the certification scheme.

3.4.4 All markings shall be legible and durable.

3.5 Manufacturer's Installation and Operation Instructions

3.5.1 The manufacturer shall:

- prepare instructions for the installation, maintenance, and operation of the product;
- provide facilities for repair of the product and supply replacement parts, if applicable; and
- provide services to ensure proper installation, inspection, or maintenance for products where it is not reasonable to expect the average user to be able to provide the installation, inspection, or maintenance.

3.6 Calibration

3.6.1 Each piece of equipment used to verify the test parameters shall be calibrated within an interval determined on the basis of stability, purpose, and usage. A copy of the calibration certificate for each piece of test equipment is required. The certificate shall indicate that the calibration was performed against working standards whose calibration is certified and traceable to an acceptable reference standard and certified by an ISO/IEC 17025 accredited calibration laboratory. The test equipment shall be clearly identified by label or sticker showing the last date of the calibration and the next due date. A copy of the service provider's accreditation certificate as an ISO/IEC 17025 accredited calibration laboratory should be available.

3.6.2 When the inspection equipment and/or environment is not suitable for labels or stickers, other methods such as etching of control numbers on the measuring device are allowed, provided documentation is maintained on the calibration status of the equipment.

3.7 Tolerances

Tolerances on units of measure shall be as described in Appendix A, unless otherwise specified.

4. PERFORMANCE REQUIREMENTS

4.1 Examination

4.1.1 Requirement

The pressure maintenance devices shall conform to the manufacturer's drawings and specifications and to certification requirements.

4.1.2 Test/Verification

A sample pressure maintenance device shall be examined and compared to the manufacturer's drawings and specifications. It shall be verified that the sample conforms to the physical and structural requirements described in Section 3, General Requirements.

4.2 Pressure Control

4.2.1 Requirement

The pressure maintenance device shall be designed so that it will be capable of adjustment to maintain an air/nitrogen pressure in the range of 15 - 75 psi (1.03 – 5.17 bar) or an operating range determined by the manufacturer.

4.2.2.1 Test/Verification – Pressure Switch

A pressure switch type pressure sensing element shall be tested at 15, 35, 55 and 75 psi (1.05, 2.4, 3.8 and 5.15 bar). The pressure switch shall operate within +/- 5% of its nominal pressure setting. The pressure switch shall have an operating differential of 2 - 8 psi (0.14 – 0.55 bar), meaning it shall transmit a signal to close at a pressure 2 - 8 psi (0.14 – 0.55 bar) greater than the pressure at which it transmits a signal to open.

4.2.2.2 Test/Verification – Pressure Regulator

A pressure regulator type pressure sensing element shall be tested at set pressures of 15, 35, 55 and 75 psi (1.05, 2.4, 3.8 and 5.15 bar). After setting the pressure regulator to each of the required set pressure settings, rapidly subject the outlet of the device to atmospheric pressure by opening a downstream ball valve. Allow discharge to atmosphere for a period of no less than five seconds, which results in a minimum pressure decay of 50% of the original pressure setting. After closing the ball valve, allow the regulator to stabilize discharge pressure (no change in measured discharge pressure for 30 secs.). Pressure regulator shall restore discharge pressure to within +/- 2% of its original pressure setting.

4.3 Flow Control

4.3.1 Requirement

The pressure maintenance device shall be designed that such that its flow rate does not exceed that available through a 1/16 in. (1.6 mm) diameter orifice at 100 psi (6.90 bar) pressure discharging to atmosphere.

4.3.2 Test/Verification

To evaluate design adequacy, tests will be made to determine the time required to drop the air pressure 5 psi (0.35 bar) from various initial pressures in a closed system of approximately 375 gallons (1420 liters). In each test the air shall discharge to atmosphere. The time to drop the pressure through the

pressure maintenance device shall be equal to or greater than the time required to drop the pressure through the 1/16 inch (1.6 mm) orifice.

4.4 Backflow Prevention Device

4.4.1 Requirement

The backflow preventative device, provided to prevent the flow of air from the sprinkler system to the air supply source in the event of air supply failure, shall not leak at or below 75 psi (5.15 bar).

4.4.2 Test/Verification

With the inlet open to atmosphere, the downstream side of the backflow prevention device shall be pneumatically tested at 15, 35, 55 and 75 psi (1.05, 2.4, 3.8 and 5.15 bar). The test shall be conducted for a duration of five minutes at each pressure. No leakage is allowed.

4.5 Strength of Parts

4.5.1 Requirement

All parts of the pressure maintenance devices which may in the course of operation be subjected to water pressure, shall withstand hydrostatic pressure of 350 psi (24.13 bar) or two times the rated working pressure, whichever is greater, without rupture, cracking or permanent distortion.

4.5.2 Test/Verification

The pressure maintenance device shall be able to withstand a hydrostatic pressure of 350 psi (24.13 bar) or two times the rated working pressure, whichever is greater, for a duration of five minutes. There shall be no visible rupture, cracking, or permanent distortion to the pressure maintenance device as a result of this test.

4.6 Durability

4.6.1 Requirement

The pressure maintenance device shall be designed to operate reliably without excessive maintenance throughout a reasonable service life.

4.6.2 Test/ Verification

To evaluate the design, a sample device will be subjected to an endurance test of 10,000 operations with the device adjusted to maintain a pressure of 28 to 30 psi (1.93 – 2.07 bar). There shall be no mechanical failure nor any appreciable change in the operating characteristics as a result of this test.

5. MANUFACTURER'S REQUIREMENTS

5.1 Demonstrated Quality Control Program

5.1.1 A quality assurance program is required to assure that subsequent products produced by the manufacturer shall present the same quality and reliability as the specific products examined. Design quality, conformance to design, and performance are the areas of primary concern.

- Design quality is determined during the examination and tests and may be documented in the certification report.
- Continued conformance to this standard is verified by the certifier's surveillance program.
- Quality of performance is determined by field performance and by periodic re-examination and testing.

5.1.2 The manufacturer shall demonstrate a quality assurance program which specifies controls for at least the following areas:

- existence of corporate quality assurance guidelines;
- incoming quality assurance, including testing;
- in-process quality assurance, including testing;
- final inspection and tests;
- equipment calibration;
- drawing and change control;
- packaging and shipping; and
- handling and disposition of non-conforming materials.

5.1.3 Documentation/Manual

There should be an authoritative collection of procedures/policies. It should provide an accurate description of the quality management system while serving as a permanent reference for implementation and maintenance of that system. The system should require that sufficient records are maintained to demonstrate achievement of the required quality and verify operation of the quality system.

5.1.4 Records

To assure adequate traceability of materials and products, the manufacturer shall maintain a record of all quality assurance tests performed, for a minimum period of two years from the date of manufacture.

5.1.5 Drawing and Change Control

The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in the certification report, may be required to be reported to, and authorized by the certification agency prior to implementation for production.

Records of all revisions to all certified products shall be maintained.

5.2 Surveillance Audit

5.2.1 An audit of the manufacturing facility may be part of the certification agencies surveillance requirements to verify implementation of the quality assurance program. Its purpose is to determine

that the manufacturer's equipment, procedures, and quality program are maintained to ensure a uniform product consistent with that which was tested and certified.

5.2.2 Certified products or services shall be produced or provided at, or provided from, location(s) disclosed as part of the certification examination. Manufacture of products bearing a certification mark is not permitted at any other location prior to disclosure to the certification agency.

5.3 Product Modification

5.3.1 The manufacturer shall notify the certification agency of changes in product construction, components, raw materials, physical characteristics, coatings, component formulation or quality assurance procedures prior to implementation.

5.4 Installation Inspections

Field inspections may be conducted to review an installation. The inspections are conducted to assess ease of application, and conformance to written specifications. When more than one application technique is used, one or all may be inspected at the discretion of the certification agency.

5.5 Manufacturing and Production Tests

5.5.1 Test Requirement No. 1 – *Body Leakage Test*

The manufacturer shall perform body leakage testing on 100 percent of production pressure maintenance devices. Body leakage testing shall be run at a test pressure equal to the rated working pressure for a minimum of 30 seconds with no evidence of body leakage or distortion.

6. BIBLIOGRAPHY

ISO/IEC 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*.

APPENDIX A: TOLERANCES

Unless otherwise stated, the following tolerances shall apply:

Mass	± 2 percent of value
Length	± 2 percent of value
Pressure	± 2 psi (0.14 bar)
Temperature	± 4°F (2°C)
Time	+ 5/–0 seconds
	+0.1/–0 minutes

Unless stated otherwise, all tests shall be carried out at a room (ambient) temperature of 68 ± 9°F (20 ± 5°C).

APPENDIX B: SAMPLE LISTING

Pressure Maintenance Devices, Dry Pipe Systems

These pressure maintenance devices automatically maintain a predetermined air or nitrogen pressure in dry pipe sprinkler systems. Some devices may be used with a noncontinuous air supply which is capable of initially filling the system. Other systems require a continuous air or nitrogen supply. Unless noted otherwise in the listing, these pressure maintenance devices have a pressure rating of 175 psi (12.05 bar).

Models TB-12 and TC-82

Models TC-82 and TB-12

Model	Type	Rated Working Pressure, psi (bar)	Remarks
TB-12	Air/Nitrogen	175 (12)	
TC-82	Air	175 (12)	