



Member of the FM Global Group

Approval Standard for Air Pressure Maintenance Device

Class Number 1032

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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.

TABLE OF CONTENTS

I SCOPE	1
II DESIGN	1
III REQUIREMENTS	1
A Pressure Sensing Element	1
B Flow Control Valve	2
C Back Flow Preventative Device	2
D Strength of Parts	2
E Durability	2
F Installation	2
G Strainer	3
H Relief Valve	3
I Materials	3
J Marking	3

I SCOPE

An air pressure maintenance device automatically maintains, within pre-set limits, the air pressure for a dry pipe sprinkler system.

FM Approval is based on examination and test of production samples, inspection of the manufacturing or quality control facilities, and continued satisfactory field experience. Particularly considered are functional suitability, adequacy of design and workmanship, uniformity and dependability of production, effectiveness of quality control, and assurance of service and replacement parts.

These requirements are guides. Mere conformity does not assure Approval; other considerations may control. Nor is strict conformity necessary; devices having different characteristics may be considered and Approved if shown to be essentially equivalent or superior in performance.

II DESIGN

The following terminology has been adapted for descriptive purposes through-out this standard.

The air pressure maintenance device consists of two main items: a pressure sensing element and a flow control valve.

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.

III REQUIREMENTS

A Pressure Sensing Element

It shall be designed so that it will be capable of adjustment to maintain air pressure in the range of 15-75 psig.

It shall have an operating differential of 2-8 psig, i.e., it shall transmit a signal to open the flow control valve at a pressure 2-8 psig less than the pressure at which it transmits a signal to close the control valve.

B Flow Control Valve

The flow control valve shall be so designed that its flow rate does not exceed that available through a 1/16 in. diameter orifice at 100 psig pressure discharging to atmosphere.

To evaluate design adequacy, tests will be made to determine the time required to drop the air pressure 5 psig from various initial pressures in a closed system of approximately 375 gallons. In each test the air shall discharge to atmosphere. The time to drop the pressure through the flow control valve shall equal or be greater than the time required to drop the pressure through the 1/16 in. orifice.

C Back Flow Preventative Device

A back flow preventative device shall be provided to prevent the flow of air from the sprinkler system to the air supply source in event of air supply failure. This device may be a separate item or an integral part of the air pressure maintenance device. This is in addition to the check valve provided as part of standard dry pipe valve trim.

Suitable tests shall be made to determine that, with system pressures of 20, 40, 60 and 75 psig, there is no reverse flow when the air supply is reduced to zero.

D Strength of Parts

All parts, which may in the course of normal operation be subjected to water pressure, will be hydrostatically tested at 300 psig for five (5) minutes. There shall be no parts damage or change in operating characteristics as a result of this test.

E Durability

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

To evaluate the design, a sample device will be subjected to an endurance test of 10,000 operations with the device adjusted to maintained 28 to 30 psig pressure.

There shall be no mechanical failure nor any appreciable change in the operating characteristics as a result of this test.

F Installation

The air pressure maintenance device shall be so located that

1. System air pressure can be restored through the manual globe valve or valves provided as part of the standard dry pipe valve trim.
2. The air line check normally furnished as standard dry pipe valve trim also prevents reverse air flow through the maintenance device.

Two control valves shall be provided to isolate the maintenance device for repairs, etc.

G Strainer

A suitable strainer shall be provided to protect small opening(s) in the air pressure maintenance device.

H Relief Valve

An air relief valve shall be provided at the dry pipe valve as part of the standard trim regardless of whether the air maintenance device has its own air relief valve or not.

I Materials

All materials used in the construction of the maintenance device shall be suitable for the intended application.

J Marking

The device shall carry the following data: name, abbreviation or trademark of the manufacturer, and type or model designation.