

Approval Standard

Video Image Smoke Detectors
for Automatic Fire Alarm Signaling

Class Number 3232
December 2011



Member of the FM Global Group

Approval Standard for Video Image Fire Detectors for Automatic Fire Alarm Signaling

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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 surveillance 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 Video Image Fire Detectors (VIFD) for Automatic Fire Alarm Signaling.

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 surveillance program.

1.2 Scope

1.2.1 This standard describes performance requirements for Video Image Fire Detectors (VIFD), and Video Image Fire Detection Systems (VIFDS) for Automatic Fire Alarm Signaling for the protection of occupants, building space, structure, area, or object and designed to detect products of combustion in a specific location.

1.2.2 This standard applies to Video Image Fire Detectors intended for use in fire alarm signaling or extinguishing system applications that operate via the image within the field of view area as defined by the camera. This standard employs test protocol dependent on the installation and operating instructions provided by the manufacturer. This information assists in defining the limits for the overall application and Approved use of the product.

1.2.3 A Video Image Fire Detector is a combination Video Image Smoke and Flame Detector (VIS&FD) and will be examined in accordance with this standard and will be listed in the Approval Guide as a Video Image Fire Detector.

1.2.4 Other types of commercially available video image detectors (such as Flame only) may not be applicable to the test protocol described in this document.

1.2.5 These detectors are intended to be installed in accordance with the manufacturer's installation instructions and in accordance with ANSI/NFPA 72 *The National Fire Alarm Code* and in a manner acceptable to the local Authority Having Jurisdiction. Other NFPA Standards may apply, such as those covering extinguishing system applications.

1.2.6 The Video Image Fire Detector is not intended to be a direct replacement for standard open area protection, but does offer detection capabilities not possible with conventional detectors. Special consideration must be given to Video Image Fire Detectors regarding the overall system's sensitivity and special care required to reduce the possibility of false alarms.

1.3 Basis for Requirements

1.3.1 The requirements of this standard are based on field experience, research and testing. Additionally, guidance from manufacturers, users, trade associations, jurisdictions and/or loss control specialists was also taken into consideration.

1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of Video Image Fire Detectors (VIFD) for the purpose of obtaining Approval. Video Image Fire Detectors 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, Video Image Fire Detectors which meet all of the requirements identified in this standard may not be FM Approved if other conditions which 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

- the suitability of the product;
- the performance of the product as specified by the manufacturer and required by FM Approvals; and as far as practical,
- the durability and reliability of the product.

1.4.2 An examination of the manufacturing facilities and audit of quality control procedures is made 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. These examinations may be repeated as part of FM Approvals' product follow-up program.

1.5 Basis for Continued Approval

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 Approval report;
- 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.

Also, as a condition of retaining Approval, manufacturers may 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 else forfeit Approval.

The effective date of this Standard is **July 1, 2013** 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. 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 10-97, *Standard for Use of the International System of Units (SI): The Modern Metric System*.

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 Applicable Documents

The following standards, test methods, and practices are referenced in this standard:

- NEMA 250 (2003) – Enclosures for Electrical Equipment
- ANSI/IEC 60529 (2004) – Degree of Protection Provided by Enclosures (IP Code)
- NFPA 70-2005 - National Electrical Code®
- NFPA 72-2007 - National Fire Alarm Code®
- ANSI/UL 268-5 - Smoke Detectors for Fire Alarm Signaling Systems (Sections 39 & 40)
- ANSI/FM 3260 (2004) - Radiant Energy Fire Detector for Automatic Fire Alarm Signaling

1.9 Definitions

For purposes of this standard, the following terms apply:

Video Image Fire Detector (VIFD) for Automatic Fire Alarm Signaling – A discrete, self contained automatic smoke and flame detection device intended to perform analysis of real time video images representative of smoke and flame as generated by accidental fire and over-heat conditions within the viewing area covered by the video camera. This detection principle typically requires a clear line-of-sight with the area being viewed by the camera and the detector can connect directly to the initiating or signaling line circuits of a fire alarm system. The detection principle might consider the plume, pattern, edge content, movement and colors associated with the smoke and flame signature(s).

Video Image Fire Detection System (VIFDS) for Automatic Fire Alarm Signaling – A combination of camera(s), processing equipment and interfaces that together can operate as an automatic smoke and flame detection system intended to perform analysis of real time video images representative of smoke as generated by accidental fire and over-heat conditions within the viewing area covered by the video camera(s). This detection system typically requires a clear line-of-sight with the area being viewed by the camera and often requires additional equipment (dedicated primary and secondary power systems) be provided as component of a fire alarm system. The detection principle might consider the plume, pattern, edge content, movement and colors associated with the smoke and flame signature(s).

Sensitivity – The sensitivity of a Video Image Fire Detector (VIFD) is the result of an engineering evaluation that includes the following parameters as specified by the manufacturer.

- Volume and Size of the smoke and fire signature required for detection
- Fuel Source(s)
- Field of View of the detector
- Minimum & Maximum detection range (fire source to the detector)
- Presence or influence of false alarm sources within the viewing area
- Purpose of the system
- Response time required