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Guide for Proper Use of Smoke Detectors in Duct Applications

National Electrical Manufacturers Association

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FOREWORD

Proper Use of Smoke Detectors in Duct Applications

The purpose of this guide is to provide much needed information concerning the proper use of smoke detectors in duct applications. Fire protection engineers, mechanical and electrical engineers, fire alarm system designers, installers, and maintenance personnel should find the contents both educational and informative.

This information is intended as a technical guide, as distinct from a listing of mandatory requirements.

This *Guide for Proper Use of Smoke Detectors in Duct Applications* has been published by the National Electrical Manufacturers Association Fire Alarm Group of the Signaling, Protection, and Communication Section, 3-SB for the automatic fire detection and alarm industry.

About the National Electrical Manufacturers Association (NEMA):

NEMA is the association of electrical equipment and medical imaging manufacturers headquartered in Rosslyn, Virginia, just outside of Washington, D.C. Its member companies manufacture a diverse set of products including power transmission and distribution equipment, lighting systems, factory automation and control systems, and medical diagnostic imaging systems. Worldwide annual sales of NEMA-scope products exceed $120 billion. NEMA is divided into eight divisions: Industrial Automation, Lighting Equipment, Building Equipment, Insulating Materials, Wire and Cable, Power Equipment, and Diagnostic Imaging and Therapy Systems. Within these divisions are over 50 product-specific sections. The Signaling Section is one such section in the Electronics Division.

Founded in 1926, the National Electrical Manufacturers Association has been developing standards for the electrical manufacturing industry and is one of the leading standards development organizations in the world. Today NEMA contributes to the marketplace and helps ensure public safety.

About the NEMA Signaling, Protection, and Communication Section (3-SB):

The objective of the section is to be the principal source of technical, training, and educational materials essential for the specification and manufacture of reliable life safety products, their installation, performance, and inspection.

The section currently represents 30 U.S., U.K., and Japanese manufacturers in support of the automatic fire detection and alarm industry and the health care communications industry. Fire detection and alarm products include life safety/fire alarm systems and devices that provide early warning of an impending or actual fire or gaseous hazard. The products detect, notify, and initiate control functions in case of hazard to life or property.

For more information on NEMA go to www.nema.org. For more information on the Signaling Section, go to www.nema.org/prod/elec/sig.

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Section 1
GENERAL

1.1 SCOPE

This guide is developed by the Signaling Protection and Communication Section. It provides technical information on basic fire alarm systems with a focus on early-warning smoke detection devices installed in duct applications. Duct mounted smoke detectors are designed to provide a specific type of protection that cannot be duplicated by any other type of system. However, there has been a tendency to misapply these devices attempting to use them as a substitute for an early warning smoke detection system. This fact, coupled with new methods of detecting smoke in ducts, has prompted the writing of this industry guide.

1.2 STANDARDS THAT APPLY

There are several important documents that provide guidance concerning the performance, application, and installation of duct detectors:

American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)
1791 Tullie Circle, N.E.
Atlanta, GA 30329

ASHRAE *Handbook and Product Directory, 2009*, Chapter 38, "Fire and Smoke Management"

National Fire Protection Association (NFPA)
1 Batterymarch Park
Quincy, MA 02269

NFPA 101	*Life Safety Code*
NFPA 72	*National Fire Alarm and Signaling Code (2010)*
NFPA 90A	*Standard for the Installation of Air-Conditioning and Ventilating Systems*
NFPA 92A	*Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences*

National Institute of Science and Technology
100 Bureau Drive
Gaithersburg, MD 20899

IR 78-1502, *Smoke Measurements in Large and Small Scale Fire Testing*

Underwriters Laboratories Inc. (UL)
333 Pfingsten Road
Northbrook, IL 60062

UL 268A	*Smoke Detectors for Duct Application*