NFPA® 720

Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment

2015 Edition

NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

AVA Documents
Document Sharing Hub

Full document details: NFPA 720 2015

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides ("NFPA Standards"), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Standards.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Standards. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

REMINDER: UPDATING OF NFPA STANDARDS

Users of NFPA codes, standards, recommended practices, and guides ("NFPA Standards") should be aware that NFPA Standards may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendment and any Errata then in effect.

In order to determine whether an NFPA Standard has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, visit the Document Information Pages on NFPA's website. The Document Information Pages provide up-to-date, document specific information including any issued Tentative Interim Amendments and Errata.

To access the Document Information Page for a specific NFPA Standard, go to http://www.nfpa.org/docinfo to choose from the list of NFPA Standards or use the search feature on the right to select the NFPA Standard number (e.g., NFPA 101). In addition to posting all existing Tentative Interim Amendments and Errata, the Document Information Page also includes the option to sign-up for an "Alert" feature to receive an email notification when new updates and other information are posted regarding the document.

ISBN: 978-145590909-4 (Print)
ISBN: 978-1455909490 (PDF)

AVA Documents
Document Sharing Hub

Full document details: NFPA 720 2015

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides ("NFPA Standards") should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Standard. The users of NFPA Standards bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Standards.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards ("the ANSI Patent Policy"), and hereby gives the following notice pursuant to that policy:

> **NOTICE:** The user's attention is called to the possibility that compliance with an NFPA Standard may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of NFPA Standards should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

NFPA Standards are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Standards for regulatory purposes should be accomplished through adoption by reference. The term "adoption by reference" means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Standards, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Standards and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA standards during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: stds_admin@nfpa.org

For more information about NFPA, visit the NFPA website at www.nfpa.org. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/freeaccess.

AVA Documents
Document Sharing Hub

Full document details: NFPA 720 2015

Copyright © 2014 National Fire Protection Association®. All Rights Reserved.

NFPA® 720

Standard for the

Installation of Carbon Monoxide (CO) Detection and Warning Equipment

2015 Edition

This edition of NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, was prepared by the Technical Committee on Carbon Monoxide Detection (SIG-CAR), released by the Correlating Committee on Signaling Systems for the Protection of Life and Property (SIG-AAC), and acted on by NFPA at its June Association Technical Meeting held June 9–12, 2014, in Las Vegas, NV. It was issued by the Standards Council on August 14, 2014, with an effective date of September 3, 2014, and supersedes all previous editions.

This edition of NFPA 720 was approved as an American National Standard on September 3, 2014.

Origin and Development of NFPA 720

With the increased concern over carbon monoxide (CO) hazards in residential applications, the National Fire Protection Association was petitioned to develop a document covering the installation of CO detectors and related equipment. In late 1993, the Technical Committee on Household Fire Warning Equipment was tasked to develop a document covering the installation and use of CO detectors. This document was originally prepared by the Technical Committee on Household Fire Warning Equipment but was returned to committee at the 1995 Annual Meeting. The NFPA Standards Council later approved the formation of the Technical Committee on Carbon Monoxide and Fuel Gas Detectors to further develop this document.

The 2003 edition reflected editorial revisions to comply with the *Manual of Style for NFPA Technical Committee Documents*. Those revisions included the addition of three administrative chapters at the beginning of the document: "Administration," "Referenced Publications," and "Definitions." Two technical chapters followed the administrative chapters: "General Provisions" from Chapter 1 (in part) of the 1998 edition and "Household Carbon Monoxide Warning Equipment" from Chapter 2 of the 1998 edition. Editorial revisions also included breaking out paragraphs with multiple requirements into individually numbered paragraphs, minimizing the use of exceptions, and using consistent headings for sections and subsections. Changes also were made in some sections to provide language and terminology that was more consistent and user friendly. The 2003 edition also contained technical revisions, including the recommendation that printed instructions for carbon monoxide alarms and detectors include minimum and recommended distances from fuel-burning appliances.

As communities began to recognize the life safety benefit of carbon monoxide warning equipment, requirements by local jurisdictions for the installation of this equipment became more common, and the need for an installation standard written in enforceable language became evident. The 2005 edition of NFPA 720 reflected that need — it was changed from a recommended practice to a standard. In addition, terms such as *family living unit* and *household* were replaced, where appropriate, with the term *dwelling unit*, to provide language consistent with standard terminology used in NFPA codes and standards.

The 2009 edition was a complete rewrite of the standard and addressed installations of carbon monoxide detection systems in commercial types of applications as well as the installation of carbon monoxide warning equipment in household applications. The 2009 edition was largely extracted from the 2007 edition of *NFPA 72*, *National Fire Alarm Code*, and was organized in a fashion similar to that of *NFPA 72*. Paragraphs that were extracted from *NFPA 72* were shown with the extract reference in brackets [ ] at the end of the paragraph. In some cases, modifications were made to the extracted text to use terminology appropriate for this standard, such as the term *carbon monoxide* instead of *fire*. In those instances, brackets

NFPA and National Fire Protection Association are registered trademarks of the National Fire Protection Association, Quincy, Massachusetts 02169.

Documents
Document Sharing Hub

Full document details: NFPA 720 2015

encased the modified words. In a similar manner, where terms were deleted, empty brackets were shown, such as where the word *smoke* was removed from the term *smoke alarm*.

Some of the technical changes in the 2009 edition included the introduction of requirements for the placement of carbon monoxide detectors in commercial applications. Those requirements were based on the Fire Protection Research Foundation report *Development of a Technical Basis for Carbon Monoxide Detector Siting Research Project*. In addition, requirements for the siting, power supply, and interconnection of carbon monoxide alarms were updated.

The previous edition of NFPA 720 was largely extracted from the 2007 edition of *NFPA 72*. Extensive changes were made in the organization and content of the 2010 edition of *NFPA 72*. As a result, the extract material from *NFPA 72* was updated in the 2012 edition of NFPA 720 to provide consistency. As in the 2009 edition, paragraphs that were extracted from *NFPA 72* were shown with the extract reference in brackets [] at the end of the paragraph. In some cases, modifications were made to the extracted text to use terminology appropriate for this standard, such as the term *carbon monoxide* instead of *fire*. In those instances, brackets encased the modifying words. In similar manner, where terms were deleted, empty brackets were shown, such as where the word *smoke* was removed from the term *smoke alarm*.

Several noteworthy technical changes were also included in the 2012 edition of NFPA 720. These included an expanded definition of the term "carbon monoxide alarm"; a revision of the secondary power requirement for systems monitored by a supervising station; a revision of the record of completion form and the inspection, testing, and maintenance form; an addition of a provision to permit performance-based designs for the location of system CO detectors; new provisions for low-frequency audible signaling for sleeping areas; removal of requirements for sensitivity testing of system CO detectors; revisions to address the replacement of combination smoke/CO alarms; new provisions to address signaling to the deaf and hard of hearing in applications of CO alarms and household CO detection systems; new provisions for CO alarms that use wireless signals to interconnect alarms within a household; and updated provisions for the transmission of signals from a household CO detection system to a supervising station.

As with the two previous editions, the 2015 edition of NFPA 720 is largely extracted from *NFPA 72*. Numerous extracts have been updated in this edition to maintain consistency with the 2013 edition of *NFPA 72*. The same convention for identifying the extracts, as well as editorial changes to the extracts, has been used as in the previous two editions.

Technical changes have also been included in the 2015 edition of NFPA 720. These include the following: revision of requirements for personnel qualifications in Chapter 4 so they are more specific to CO systems; revision of the requirements for the audible CO alarm signal in Chapters 5 and 9 to allow the use of more than one tone; revision of the inspection and testing tables in Chapter 8 so they are consistent with the format used in *NFPA 72*; revision of the requirements in Chapter 9 for secondary power supply standby capacity from 8 to 24 hours; revision of the requirements in Chapter 9 for distinctive alarm signals to make it clear that CO, fire, and other alarm signals must each use a different audible signal; and the addition of new Annex C, Guidelines for Emergency Responders.

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

Correlating Committee on Signaling Systems for the Protection of Life and Property (SIG-AAC)

Robert P. Schifiliti, *Chair*
R. P. Schifiliti Associates, Inc., MA [SE]

Lee F. Richardson, *Administrative Secretary*
National Fire Protection Association, MA

Douglas M. Aiken, Lakes Region Mutual Fire Aid, NH [U]
Rep. International Municipal Signal Association
Andrew G. Berezowski, Honeywell Inc., CT [M]
Rep. National Electrical Manufacturers Association
Art Black, Carmel Fire Protection Associates, CA [E]
David L. Boswell, Hughes Associates, Inc., CO [SE]
J. Robert Boyer, UTC/Edwards Company, NJ [M]
John C. Fannin III, SafePlace Corporation, DE [U]
Louis T. Fiore, L. T. Fiore, Inc., NJ [IM]
Rep. Central Station Alarm Association
Bruce Fraser, Fraser Fire Protection Services, MA [SE]
Vic Humm, Vic Humm & Associates, TN [SE]
David F. Klein, Las Vegas Fire & Rescue, NV [E]
Rep. International Association of Fire Chiefs
Peter A. Larrimer, U.S. Department of Veterans Affairs, PA [U]
A. M. Fred Leber, Leber/Rubes Inc. (LRI), Canada [SE]
James M. Mundy, Jr., Asset Protection Associates, Ltd., NY [M]
Rep. Automatic Fire Alarm Association, Inc.
Lynn Nielson, City of Henderson, NV [E]
Thomas F. Norton, Norel Service Company, Inc., MA [IM]
(Vote Limited to Document: 72)
Thomas J. Parrish, Telgian Corporation, MI [U]
Rodger Reiswig, Tyco/SimplexGrinnell, FL [M]
Lawrence J. Shudak, UL LLC, IL [RT]
Tom G. Smith, Oklahoma City, OK [IM]
Rep. National Electrical Contractors Association

Alternates

Richard W. Bukowski, The RJA Group, Inc., MD [SE]
(Alt. to B. Fraser)
Anthony J. Capowski, Tyco/SimplexGrinnell, MA [M]
(Alt. to R. Reiswig)
Louis Chavez, UL LLC, IL [RT]
(Alt. to L. J. Shudak)
Raymond A. Gill, Arup, DC [SE]
(Alt. to A. M. F. Leber)
Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc., GA [M]
(Alt. to J. M. Mundy, Jr.)
Jack McNamara, Bosch Security Systems, NY [M]
(Alt. to A. G. Berezowski)
Earl P. Valois, City of New Orleans Fire Department, LA [E]
(Alt. to D. F. Klein)
Jeffrey G. Van Keuren, UTC Climate, Controls & Security/Edwards, FL [M]
(Alt. to J. R. Boyer)
Frank L. Van Overmeiren, FP&C Consultants, Inc., IN [SE]
(Alt. to V. Humm)

Nonvoting

Merton W. Bunker, Jr., U.S. Department of State, VA [U]
Rep. TC on Protected Premises Fire Alarm Systems
Laurence J. Dallaire, U.S. Architect of the Capitol, DC [E]
Rep. TC on Household Fire Alarm Systems
Manuelita E. David Aon Fire Protection Engineering, CA [I]
Rep . TC on Fundamentals of Fire Alarm Systems
Jeffrey G. Knight, City of Newton Fire Department, MA [U]
Rep. TC on Public Fire Reporting Systems
David O. Lowrey, City of Boulder Fire Rescue, CO [E]
Rep. TC on Notification Appliances for Fire Alarm Systems
J. Jeffrey Moore, Hughes Associates, Inc., OH [SE]
Rep. TC on Testing & Maintenance of Fire Alarm Systems
Wayne D. Moore, Hughes Associates, Inc., RI [SE]
Rep. TC on Emergency Communication Systems
Daniel J. O'Connor, Aon Fire Protection Engineering, IL [I]
Rep. TC on Initiating Devices for Fire Alarm Systems
Warren E. Olsen, Fire Safety Consultants, Inc., IL [E]
Rep. TC on Supervising Station Fire Alarm Systems
Martin H. Reiss, The RJA Group, Inc., MA [SE]
Rep. Safety to Life Correlating Committee
Evan E. Stauffer, Jr., U.S. Department of the Navy, PA
Rep. TC Public Emergency Service Communications
Dean K. Wilson, Hughes Associates, Inc., PA [SE]
(Member Emeritus)

Lee F. Richardson, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the installation, performance, maintenance, testing, and use of signaling components and signaling systems for the protection of life, property and mission continuity.

AVA Documents 2015 Edition NFPA Document Sharing Hub
Full document details: NFPA 720 2015

Technical Committee on Carbon Monoxide Detection (SIG-CAR)

Thomas F. Norton, *Chair*
Norel Service Company, Inc., MA [IM]

Rodger Reiswig, *Secretary*
Tyco/SimplexGrinnell, FL [M]
(Alt. to Jeffrey R. Brooks)

William J. Aaron, Jr., Code Consultants, Inc., MO [SE]
Blair T. Ames, Montgomery-Ames Associates, MA [M]
Art Black, Carmel Fire Protection Associates, CA [E]
H. Wayne Boyd, U.S. Safety & Engineering Corporation, CA [M]
Jeffrey R. Brooks, Tyco/SimplexGrinnell, MA [M]
Shane M. Clary, Bay Alarm Company, CA [M]
Rep. Automatic Fire Alarm Association, Inc.
Bradford T. Cronin, Newport Fire Department, RI [E]
Scott G. Davis, GexCon US, MD [SE]
Lee C. DeVito, FIREPRO Incorporated, MA [SE]
Jamie Ferrino-McAllister, Combustion Science & Engineering, Inc., MD [SE]
Louis T. Fiore, L. T. Fiore, Inc., NJ [IM]
Rep. Central Station Alarm Association
Wendy B. Gifford, Consultant, IL [SE]
Daniel T. Gottuk, Hughes Associates, Inc., MD [SE]
Deborah Hanson, First Alert BRK Brands Inc., IL [M]
Rick Heffernan, SDi, NJ [M]
Rep. National Electrical Manufacturers Association
Richard Hoffman, Intertek, IL [RT]
Rep. Intertek Testing Services
Jeffrey G. Knight, City of Newton Fire Department, MA [U]
Rep. International Municipal Signal Association
David E. Mills, UL LLC, IL [RT]
James A. Petersen, Petersen Engineering, TX [SE]
Anthony V. Pierce, Forsyth County Planning & Development, GA [E]
Larry Ratzlaff, UTC/Kidde Safety, IL [M]
Richard Jay Roberts, Honeywell Life Safety, IL [M]
James M. Rowland, Quality Electric Service, LLC, NJ [IM]
Ed Van Walraven, Aspen Fire Protection District, CO [E]

Alternates

Shane Courbier, Gentex Corporation, MI [M]
(Alt. to R. Heffernan)
Richard B. Cullwell, Jr., 3M Company, CO [M]
(Alt. to B. T. Ames)
Thomas J. McNelis, Jarden Safety & Security/BRK Brands, IL [M]
(Alt. to D. Hanson)
Ken Mott, UTC/Kidde Safety, CO [M]
(Alt. to L. Ratzlaff)
Andrew Mueller, Code Consultants, Inc., MO [SE]
(Alt. to W. J. Aaron, Jr.)
James M. Mundy, Jr., Asset Protection Associates, Ltd., NY [M]
(Alt. to S. M. Clary)
Stephen M. Olenick, Combustion Science & Engineering, Inc., MD [SE]
(Alt. to J. Ferrino-McAllister)
John L. Parssinen, UL LLC, IL [RT]
(Alt. to D. E. Mills)
D. Chris Roberts, Global Health & Safety, LLC, TX [M]
(Alt. to H. W. Boyd)
Kurt A. Ruchala, FIREPRO Incorporated, MA [SE]
(Alt. to L. C. DeVito)

Nonvoting

Donald W. Switzer, U.S. Consumer Product Safety Commission, MD [C]

Lee F. Richardson, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents addressing the selection, installation, operation, and maintenance of carbon monoxide warning equipment.

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

Contents

Chapter 1 Administration **720–** 7
1.1 Scope **720–** 7
1.2 Purpose **720–** 7
1.3 Application **720–** 7
1.4 Equivalency **720–** 7
1.5 Units of Measure **720–** 7

Chapter 2 Referenced Publications **720–** 7
2.1 General **720–** 7
2.2 NFPA Publications **720–** 8
2.3 Other Publications **720–** 8
2.4 References for Extracts in Mandatory Sections **720–** 8

Chapter 3 Definitions **720–** 8
3.1 General **720–** 8
3.2 NFPA Official Definitions **720–** 8
3.3 General Definitions **720–** 8

Chapter 4 Fundamentals of Carbon Monoxide Detection Systems **720–**10
4.1 Application **720–**10
4.2 Purpose **720–**10
4.3 Equipment **720–**10
4.4 Personnel Qualifications **720–**10
4.5 Power Supplies **720–**10
4.6 Distinctive Signals **720–**13
4.7 Alarm Signals **720–**13
4.8 Supervisory Signals **720–**13
4.9 Trouble Signals **720–**14
4.10 [Carbon Monoxide] Control Function Status Indicators **720–**14
4.11 Performance and Limitations **720–**14
4.12 Annunciation and Annunciation Zoning **720–**14
4.13 Monitoring Integrity **720–**15
4.14 Documentation **720–**16

Chapter 5 Protected Premises Carbon Monoxide Detection Systems **720–**25
5.1 Application **720–**25
5.2 General **720–**25
5.3 System Features **720–**25
5.4 System Performance and Integrity **720–**25
5.5 Performance of Initiating Device Circuits (IDCs) **720–**27
5.6 Performance of Signaling Line Circuits (SLCs) **720–**27
5.7 Performance of Notification Appliance Circuits (NACs) **720–**27
5.8 System Requirements **720–**27
5.9 Signal Annunciation **720–**30
5.10 Off-Premises Signals **720–**30
5.11 Protected Premises Carbon Monoxide Control Functions **720–**30
5.12 Special Requirements for Low-Power Radio (Wireless) Systems **720–**31

Chapter 6 Notification Appliances for Carbon Monoxide Detection Systems **720–**31
6.1 Application **720–**31
6.2 Purpose **720–**32
6.3 General **720–**32
6.4 Audible Characteristics **720–**32
6.5 Visible Characteristics — Public Mode **720–**34
6.6 Visible Characteristics — Private Mode **720–**37
6.7 Supplementary Visible Signaling Methods **720–**37
6.8 Textual Audible Appliances **720–**37
6.9 Textual and Graphical Visible Appliances **720–**37
6.10 Tactile Appliances **720–**38
6.11 Standard Emergency Service Interface **720–**38

Chapter 7 Off-Premises Signal Transmission **720–**38
7.1 Application **720–**38
7.2 General **720–**39
7.3 Prearranged Testing **720–**39
7.4 Operation and Record Keeping **720–**39

Chapter 8 Inspection, Testing, and Maintenance **720–**39
8.1 Application **720–**39
8.2 General **720–**39
8.3 Inspection **720–**39
8.4 Testing **720–**41
8.5 Maintenance **720–**48
8.6 Records **720–**48
8.7 Single- and Multiple-Station Carbon Monoxide Alarms **720–**56
8.8 Household Carbon Monoxide Detection Systems **720–**56

Chapter 9 Single- and Multiple-Station Alarms and Household Carbon Monoxide Detection Systems **720–**56
9.1 Application **720–**56
9.2 Purpose **720–**56
9.3 Basic Requirements **720–**56
9.4 Required Protection **720–**56
9.5 Power Supplies **720–**57
9.6 Equipment Performance **720–**58
9.7 Installation **720–**60
9.8 Maintenance and Testing **720–**60
9.9 Markings and Instructions **720–**60

AVA Documents 2015 Edition NFPA Document Sharing Hub

Full document details: NFPA 720 2015

Annex A Explanatory Material **720**–60

Annex B Dangers of Carbon Monoxide **720**–77

Annex C Guidelines for Emergency Responders **720**–78

Annex D Informational References **720**–79

Index **720**–80

Documents
Document Sharing Hub

Full document details: NFPA 720 2015

NFPA 720

Standard for the

Installation of Carbon Monoxide (CO) Detection and Warning Equipment

2015 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFPA Standards." They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex D. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex D.

Chapter 1 Administration

1.1* Scope.

1.1.1 This standard is primarily concerned with life safety, not with protection of property.

1.1.2* This standard covers the selection, design, application, installation, location, performance, inspection, testing, and maintenance of carbon monoxide detection and warning equipment in buildings and structures.

1.1.3 This standard contains requirements for the selection, installation, operation, and maintenance of equipment that detects concentrations of carbon monoxide that could pose a life safety risk to most occupants in buildings and structures.

1.2* Purpose.

1.2.1 The purpose of this standard is to provide requirements for carbon monoxide detection and warning equipment intended to warn occupants of the presence of carbon monoxide in sufficient time to allow occupants to either escape or take other appropriate action and where required to summon aid.

1.2.2 The requirements provided by this standard address the means of signal initiation, transmission, notification, and annunciation; the levels of performance; and the reliability of carbon monoxide detection and warning equipment.

1.3 Application.

1.3.1 The requirements of this standard apply to the installation of carbon monoxide detection and warning equipment, including the following:

(1) Single- and multiple-station carbon monoxide alarms
(2) Carbon monoxide detectors and their related systems and components

1.3.2* Carbon monoxide detection and warning equipment shall not be used in lieu of fire detection or warning equipment required by *NFPA 72, National Fire Alarm and Signaling Code*; NFPA *101, Life Safety Code*; or *NFPA 5000, Building Construction and Safety Code*.

1.4 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.4.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 The system, method, device, or appliance shall be approved for the intended purpose by the authority having jurisdiction.

1.4.3 All alarms or detectors and related equipment having materials or forms different from those detailed in this standard shall be examined and tested in accordance with applicable standards and, if found equivalent, shall be permitted to be approved.

1.5 Units of Measure.

1.5.1 The units of measure in this standard are presented in U.S. customary units (inch/pound units).

1.5.2 Where presented, International System (SI) units follow the inch/pound units in parentheses.

1.5.3 Where both systems of units are presented, either system shall be acceptable for satisfying the requirements in this standard.

1.5.4 Where both systems of units are presented, users of this standard shall apply one set of units consistently and shall not alternate between units.

1.5.5 The values presented for measurements in this standard are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

1.5.6* Where extracted text contains values expressed in only one system of units, the values in the extracted text have been retained without conversion to preserve the values established by the responsible technical committee in the source document.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 70®, National Electrical Code®, 2014 edition.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA *101®, Life Safety Code®,* 2015 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 2013 edition.

AVA Documents 2015 Edition Document Sharing Hub

Full document details: NFPA 720 2015

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 2013 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2013 edition.

NFPA 5000®, Building Construction and Safety Code®, 2015 edition.

2.3 Other Publications.

2.3.1 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI A-58.1, *Building Code Requirements for Minimum Design Loads in Buildings and Other Structures*, 1982.

ANSI S1.4A, *Specification for Sound Level Meters*, 1985 (R2006).

ANSI S3.41, *Audible Emergency Evacuation Signal*, 1990 (R2001).

ANSI/TIA 568-C.3, *Optical Fiber Cabling Components Standard,* June 2008.

2.3.2 ISO Publications. International Organization for Standardization, 1, rue de Varembé, case postale 56, CH-1211 Geneve 20, Switzerland.

ISO 7731, *Ergonomics — Danger signals for work places — Auditory danger signals*, 2003.

2.3.3 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 1971, *Signaling Devices for Hearing Impaired*, November 2002, revised October 2008.

ANSI/UL 2034, *Single and Multiple Station Carbon Monoxide Alarms*, February 2008, revised February 2009.

ANSI/UL 2075, *Gas and Vapor Detectors and Sensors*, March 2013.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2013 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2013 edition.

NFPA 5000®, Building Construction and Safety Code®, 2015 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary,* 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, informational note, or other means as permitted in the *Manual of Style for NFPA Technical Committee Documents.*

3.3 General Definitions.

3.3.1* Acoustically Distinguishable Space (ADS). An emergency communications system notification zone, or subdivision thereof, that might be an enclosed or otherwise physically defined space, or that might be distinguished from other spaces because of different acoustical, environmental, or use characteristics, such as reverberation time and ambient sound pressure level. [**72,** 2013]

3.3.2 Alarm.

3.3.2.1 ***Carbon Monoxide Alarm.*** A single- or multiple-station carbon monoxide alarm intended for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct audible signal comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in a single unit operated from a power source either located in the unit or obtained at the point of installation.

3.3.2.2 ***Multiple-Station [Carbon Monoxide] Alarm.*** A single-station [carbon monoxide] alarm capable of being interconnected to one or more additional alarms so that the actuation of one causes the appropriate alarm signal to operate in all interconnected alarms. [**72,** 2013]

3.3.2.3 ***Single-Station [Carbon Monoxide] Alarm.*** A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated from a power source either located in the unit or obtained at the point of installation. [**72,** 2013]

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

3.3.3* [Carbon Monoxide] Control Function Interface Device. A listed [carbon monoxide detection] system component that directly interfaces with the system that operates the [carbon monoxide] control function. [**72,** 2013]

3.3.4 Carbon Monoxide Control Functions. Carbon monoxide control elements or systems that are initiated by the carbon monoxide detection system and either increase the level of life safety for occupants or control the spread of the harmful effects of carbon monoxide.

3.3.5 [Carbon Monoxide Detection] Control Unit. A component of the [carbon monoxide detection] system, provided with primary and secondary power sources, which receives signals from initiating devices or other [carbon monoxide detection] control units, and processes these signals to determine part or all of the required [carbon monoxide detection] system output function(s). [**72**, 2013]

3.3.6 Carbon Monoxide Detector. A device having a sensor that responds to carbon monoxide gas that is connected to an alarm control unit.

3.3.7 [Carbon Monoxide] Warning Equipment. Any detector, alarm, device, or material related to single- and multiple-station alarms or household [carbon monoxide detection] systems. [**72,** 2013]

3.3.8* Communications Center. A building or portion of a building that is specifically configured for the primary purpose of providing emergency communications services or public safety answering point (PSAP) services to one or more public safety agencies under the authority or authorities having jurisdiction. [**1221,**2013]

3.3.9 Control Unit. A system component that monitors inputs and controls outputs through various types of circuits. [**72**, 2013]

3.3.10 Dwelling Unit. One or more rooms arranged for complete, independent housekeeping purposes, with space for eating, living, and sleeping; facilities for cooking; and provisions for sanitation. [**5000,** 2015]

3.3.11* Emergency Response Agency (ERA). Organizations providing law enforcement, emergency medical, fire, rescue, communications, and related support services. [**1221,** 2013]

3.3.12 Fireplace. A hearth, fire chamber, or similarly prepared area and a chimney. [**211,** 2013]

3.3.13 Frequency. Minimum and maximum time between events. [**72,** 2013]

3.3.13.1 ***Weekly Frequency.*** Fifty-two times per year, once per calendar week. [**72**, 2013]

3.3.13.2 ***Monthly Frequency.*** Twelve times per year, once per calendar month. [**72**, 2013]

3.3.13.3 ***Quarterly Frequency.*** Four times per year with a minimum of 2 months, maximum of 4 months. [**72**, 2013]

3.3.13.4 ***Semiannual Frequency.*** Twice per year with a minimum of 4 months, maximum of 8 months. [**72**, 2013]

3.3.13.5 ***Annual Frequency.*** Once per year with a minimum of 9 months, maximum 15 of months. [**72**, 2013]

3.3.14* Fuel-Burning Appliance. A device that burns solid, liquid, or gaseous fuel or a combination thereof.

3.3.15 Gateway. A device that is used in the transmission of serial data (digital or analog) from the [carbon monoxide detection] control unit to other building system control units, equipment, or networks and/or from other building system control units to the [carbon monoxide detection] control unit. [**72**, 2013]

3.3.16 Multiple-Purpose Alarm. An alarm that incorporates detection capabilities for more than one hazardous condition, such as fire, fuel gas, or carbon monoxide.

3.3.17 Notification Appliance. A [ ] system component such as a bell, horn, speaker, light, or text display that provides audible, tactile, or visible outputs, or any combination thereof. [**72**, 2013]

3.3.18 Occupiable. A room or enclosed space designed for human occupancy. [**72,** 2013]

3.3.19 Occupiable Area. An area of a facility occupied by people on a regular basis. [**72,** 2013]

3.3.20 Protected Premises. The physical location protected by a [ ] system. [**72**, 2013]

3.3.21 Response Plan. The action to be taken in response to a carbon monoxide alarm signal.

3.3.22* Separate Sleeping Area. The area of a dwelling unit where the bedrooms or sleeping rooms are located.

3.3.23 Signal.

3.3.23.1 ***Carbon Monoxide Alarm Signal.*** A signal indicating a concentration of carbon monoxide at or above the alarm threshold that could pose a risk to the life safety of the occupants and that requires immediate action.

3.3.23.2 ***Supervisory Signal.*** A signal indicating the need for action in connection with a pre-alarm condition, or in connection with the supervision of protected premises carbon monoxide safety functions or equipment, or the maintenance features of related systems.

3.3.23.3 ***Trouble Signal.*** A signal initiated by a system or device indicative of a fault in a monitored circuit, system, or component.

3.3.24 Supplementary. As used in this standard, *supplementary* refers to equipment or operations not required by this standard and designated as such by the authority having jurisdiction. [**72**, 2013]

3.3.25 System.

3.3.25.1 ***Carbon Monoxide Detection System.*** A system or portion of a combination system that consists of a control unit, components, and circuits arranged to monitor and annunciate the status of carbon monoxide alarm initiating devices and to initiate the appropriate response to those signals.

3.3.25.2 ***Combination Carbon Monoxide Detection System.*** A carbon monoxide detection system in which components are used, in whole or in part, in common with a non–carbon monoxide signaling system, and in which components are not used as part of a fire alarm system.

3.3.25.3* ***Combination System.*** A fire alarm system in which components are used, in whole or in part, in common with a non-fire signaling system. [**72**, 2013]

AVA Documents 2015 Edition NFPA Document Sharing Hub

Full document details: NFPA 720 2015

3.3.25.4 ***Fire Alarm System.*** A system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals. [**72**, 2013]

3.3.25.5 ***Household Carbon Monoxide Detection System.*** A system of devices that uses a control unit to produce an alarm signal in the household for the purpose of notifying the occupants of the presence of concentrations of carbon monoxide that could pose a life safety risk.

Chapter 4 Fundamentals of Carbon Monoxide Detection Systems

4.1 Application.

4.1.1 The basic functions of a complete carbon monoxide detection system shall comply with the requirements of this chapter.

4.1.2 The requirements of this chapter shall apply to carbon monoxide detection systems, equipment, and components addressed in Chapter 5 through Chapter 8 of this document.

4.2 Purpose. The purpose of carbon monoxide detection systems shall be primarily to provide notification of predetermined exposure levels of carbon monoxide.

4.3 Equipment.

4.3.1 Equipment constructed and installed in conformity with this standard shall be listed for the purpose for which it is used. [**72:**10.3.1]

4.3.2 System components shall be installed, tested, inspected, and maintained in accordance with the manufacturer's published instructions and this standard. [**72:**10.3.2]

4.3.3* All devices and appliances that receive their power from the initiating device circuit or signaling line circuit of a control unit shall be listed for use with the control unit. [**72:**10.3.3]

4.3.4* Where no carbon monoxide product listing standard exists, products listed for fire alarm service shall be permitted provided all the requirements of this standard are met.

4.4 Personnel Qualifications.

4.4.1 System Designer.

4.4.1.1 Carbon monoxide detection system plans and specifications shall be developed in accordance with this standard by persons who are knowledgeable and experienced in the proper design, application, installation, and testing of the systems.

4.4.1.2 Where available, state or local licensure regulations shall be followed to determine qualified personnel.

4.4.1.2.1 Depending on state or local licensure regulations, qualified personnel shall be permitted to include, but not be limited to, one or more of the following:

(1) Personnel who are factory trained and certified for carbon monoxide detection system design of the specific type and brand of system being designed and who are acceptable to the authority having jurisdiction
(2) Personnel with expertise in the design of carbon monoxide systems that are registered, licensed, or certified by state or local authority

4.4.1.3 The system designer shall provide evidence of qualifications and/or certifications when requested by the authority having jurisdiction.

4.4.1.4 The system designer shall be identified on the system design documents. [**72:**10.5.1.3]

4.4.2 System Installer.

4.4.2.1 [Carbon monoxide detection] system installation personnel shall be qualified or shall be supervised by persons who are qualified in the installation, inspection, and testing of the systems. [**72:**10.5.2.1]

4.4.2.2 Where available, state or local licensure regulations shall be followed to determine qualified personnel.

4.4.2.2.1 Depending on state or local licensure regulations, qualified personnel shall be permitted to include, but not be limited to, one or more of the following:

(1) Personnel with expertise in the installation of carbon monoxide systems that are registered, licensed, or certified by a state or local authority
(2) Personnel who are factory trained and certified for carbon monoxide detection system installation of the specific type and brand of system being designed and who are acceptable to the authority having jurisdiction

4.4.2.3 The system installer shall provide evidence of qualifications and/or certifications when requested by the authority having jurisdiction.

4.4.3 Inspection, Testing, and Maintenance Personnel.

4.4.3.1* Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of systems addressed within the scope of this standard.

4.4.3.1.1 Qualified personnel shall be permitted to include, but not be limited to, one or more of the following:

(1)*Personnel who are factory trained and certified for the specific type and brand of system being serviced
(2)*Personnel who are registered, licensed, or certified by a state or local authority to perform service on systems addressed within the scope of this standard
(3) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of systems within the scope of this standard

4.4.3.2 Evidence of qualifications shall be provided to the authority having jurisdiction upon request. [**72:**10.5.3]

4.5 Power Supplies.

4.5.1 Scope. The provisions of this section shall apply to power supplies used for carbon monoxide detection systems.

4.5.2 Code Conformance. All power supplies shall be installed in conformity with the requirements of *NFPA 70*, *National Electrical Code*, for such equipment and with the requirements indicated in this subsection. [**72:**10.6.2]

4.5.3 Power Supply Sources.

4.5.3.1 Power shall be supplied in compliance with either 4.5.3.2 or 4.5.4. [**72:**10.6.3.1]

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

4.5.3.2 Unless configured in compliance with 4.5.4, at least two independent and reliable power supplies shall be provided, one primary and one secondary. [**72:**10.6.3.2]

4.5.3.3 Each power supply shall be of adequate capacity for the application. [**72:**10.6.3.3]

4.5.3.4 Monitoring the integrity of power supplies shall be in accordance with 4.5.9.6. [**72:**10.6.3.4]

4.5.4 Uninterruptible Power Supplies (UPS).

4.5.4.1 The UPS device shall be configured in compliance with NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, for a Type O, Class 24, Level 1 system. [**72:**10.6.4.1]

4.5.4.2 The UPS device shall comply with the requirements of 4.5.5. [**72:**10.6.4.2]

4.5.4.3 Failure of the UPS shall result in the initiation of a trouble signal in accordance with Section 4.9. [**72:**10.6.4.3]

4.5.5 Primary Power Supply.

4.5.5.1 Branch Circuit. The branch circuit supplying the [carbon monoxide] equipment(s) [] shall supply no other loads and shall be supplied by one of the following:

(1) Commercial light and power
(2) An engine-driven generator or equivalent in accordance with 4.5.10.2, where a person specifically trained in its operation is on duty at all times
(3) An engine-driven generator or equivalent arranged for cogeneration with commercial light and power in accordance with 4.5.10.2, where a person specifically trained in its operation is on duty at all times

[**72:**10.6.5.1]

4.5.5.2 Circuit Identification and Accessibility.

4.5.5.2.1 The location of the branch circuit disconnecting means shall be permanently identified at the control unit. [**72:**10.6.5.2.1]

4.5.5.2.2 The circuit disconnecting means shall be clearly marked and shall be accessible only to authorized personnel.

4.5.5.3 Mechanical Protection. The branch circuit(s) and connections shall be protected against physical damage. [**72:**10.6.5.3]

4.5.5.4 Overcurrent Protection. An overcurrent protective device of suitable current-carrying capacity that is capable of interrupting the maximum short-circuit current to which it can be subject shall be provided in each ungrounded conductor. [**72:**10.6.5.5]

4.5.6 Secondary Power Supply.

4.5.6.1* Secondary Power Supply for Protected Premises [Carbon Monoxide Detection] Systems.

4.5.6.1.1 The secondary power supply shall consist of one of the following:

(1) A storage battery dedicated to the [carbon monoxide detection] system arranged in accordance with 4.5.9
(2) An automatic-starting, engine-driven generator serving the branch circuit specified in 4.5.5.1 and arranged in accordance with 4.5.10.3.1, and storage batteries dedicated to the [carbon monoxide detection] system with 4 hours of capacity arranged in accordance with 4.5.9

[**72:**10.6.7.3.1]

4.5.6.1.2 Secondary circuits that provide power to the control unit and are not integral to the unit shall be protected against physical damage. [**72:**10.6.7.3.2]

4.5.6.2 Capacity.

4.5.6.2.1* Where a combination (fire) system is used, the secondary power supply capacity requirements shall comply with 4.5.6.2.3 and with those of *NFPA 72, National Fire Alarm and Signaling Code.*

4.5.6.2.2* Where a combination carbon monoxide detection system is used, the secondary power supply capacity requirements shall comply with 4.5.6.2.3 and with the provisions of the applicable NFPA code or standard.

4.5.6.2.3 The secondary power supply shall have sufficient capacity to operate the carbon monoxide detection system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours and, at the end of that period, shall be capable of operating the carbon monoxide detection system and all notification appliances for 12 hours. Notification appliances shall perform in accordance with 5.8.6.5.

Exception: The 12-hour requirement shall be permitted to be reduced to 5 minutes where the system is monitored by a supervising station and emergency response in accordance with 7.2.2 is provided.

4.5.6.2.4 For systems not addressed by 4.5.6.2.1 through 4.5.6.2.3, the secondary power supply capacity required shall include all power supply loads that are not automatically disconnected upon the transfer to the secondary power supply.

4.5.6.3 Secondary Power Operation. Operation on secondary power shall not affect the required performance of a carbon monoxide detection system.

4.5.7* Continuity of Power Supplies.

4.5.7.1 The secondary power supply shall automatically provide power to the protected premises system within 10 seconds whenever the primary power supply fails to provide the minimum voltage required for proper operation. [**72:**10.6.6.1]

4.5.7.2 Required signals shall not be lost, interrupted, or delayed by more than 10 seconds as a result of the primary power failure. [**72:**10.6.6.3]

4.5.7.2.1 Storage batteries dedicated to the [carbon monoxide detection] system or an uninterruptible power supply (UPS) arranged in accordance with the provisions of NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, shall be permitted to supplement the secondary power supply to ensure required operation during the transfer period. [**72:**10.6.6.3.1]

4.5.7.2.2 Where a UPS is employed in 4.5.7.2.1, a positive means for disconnecting the input and output of the UPS system while maintaining continuity of power supply to the load shall be provided. [**72:**10.6.6.3.2]

4.5.8 Power Supply for Remotely Located Control Equipment.

4.5.8.1* Additional power supplies, where provided for control units, circuit interfaces, or other equipment essential to system operation, and located remotely from the main control unit, shall be comprised of a primary and secondary power

AVA Documents 2015 Edition NFPA Document Sharing Hub
Full document details: NFPA 720 2015

supply that shall meet the same requirements as those of 4.5.1 through 4.5.7 and 4.13.2. [**72:**10.6.8.1]

4.5.8.2 The location of any remotely located power supply shall be identified at the master control unit. [**72:**10.6.8.2]

4.5.8.3 The master control unit display shall be permitted to satisfy the requirement of 4.5.8.2. [**72:**10.6.8.3]

4.5.8.4 The location of any remotely located power supply shall be identified on the record drawings. [**72:**10.6.8.4]

4.5.9 Storage Batteries.

4.5.9.1 Marking.

4.5.9.1.1 Batteries shall be marked with the month and year of manufacture using the month/year format. [**72:**10.6.10.1.1]

4.5.9.1.2 Where the battery is not marked with the month/year by the manufacturer, the installer shall obtain the date-code and mark the battery with the month/year of battery manufacture. [**72:**10.6.10.1.2]

4.5.9.2 Location. Storage batteries shall be located so that the [carbon monoxide detection] equipment, including overcurrent devices, are not adversely affected by battery gases and shall conform to the requirements of *NFPA 70, National Electrical Code*, Article 480. [**72:**10.6.10.2]

4.5.9.2.1 Cells shall be suitably insulated against ground-faults. [**72:**10.6.10.2.1]

4.5.9.2.2 Cells shall be suitably insulated against crosses. [**72:**10.6.10.2.2]

4.5.9.2.3 Cells shall be mounted in such a manner so as to be protected from physical damage. [**72:**10.6.10.2.3]

4.5.9.2.4 Racks shall be suitably protected against deterioration. [**72:**10.6.10.2.4]

4.5.9.2.5 If not located in or adjacent to the [carbon monoxide detection] control unit, the batteries and their charger location shall be permanently identified at the [carbon monoxide detection] control unit. [**72:**10.6.10.2.5]

4.5.9.3 Battery Charging.

4.5.9.3.1 Adequate facilities shall be provided to automatically maintain the battery fully charged under all conditions of normal operation. [**72:**10.6.10.3.1]

4.5.9.3.2 Adequate facilities shall be provided to recharge batteries within 48 hours after fully charged batteries have been subject to a single discharge cycle as specified in 4.5.6.2. [**72:**10.6.10.3.2]

4.5.9.3.3 Upon attaining a fully charged condition, the charge rate shall not be so excessive as to result in battery damage. [**72:**10.6.10.3.3]

4.5.9.3.4 Supervising stations shall maintain spare parts or units available, which shall be used to restore failed charging capacity prior to the consumption of one-half of the capacity of the batteries for the supervising station equipment. [**72:**10.6.10.3.5]

4.5.9.4 Overcurrent Protection.

4.5.9.4.1 The batteries shall be protected against excessive load current by overcurrent devices. [**72:**10.6.10.4.1]

4.5.9.4.2 The batteries shall be protected from excessive charging current by overcurrent devices or by automatic current-limiting design of the charging source. [**72:**10.6.10.4.2]

4.5.9.5 Metering. The charging equipment shall provide either integral meters or readily accessible terminal facilities for the connection of portable meters by which the battery voltage and charging current can be determined. [**72:**10.6.10.5]

4.5.9.6 Monitoring Integrity of Battery Charger.

4.5.9.6.1 Means for monitoring integrity appropriate for the batteries and charger employed shall be provided to detect a battery charger failure. [**72:**10.6.10.6.1]

4.5.9.6.2 Failure of the battery charger shall result in the initiation of a trouble signal in accordance with Section 4.9. [**72:**10.6.10.6.2]

4.5.10 Engine-Driven Generators.

4.5.10.1 Application and Installation. The application and installation of engine-driven generators shall be as specified in 4.5.10.2 through 4.5.10.7. [**72:**10.6.11.1]

4.5.10.2 Primary Power Supply.

4.5.10.2.1 Engine-driven generators arranged as the primary supply shall be designed in an approved manner. [**72:**10.6.11.2.1]

4.5.10.2.2 Engine-driven generators arranged as the primary supply shall be installed in an approved manner. [**72:**10.6.11.2.2]

4.5.10.3 Secondary Power Supplies.

4.5.10.3.1 Engine-driven generators used to provide secondary power for a [carbon monoxide detection] system shall comply with NFPA 110, *Standard for Emergency and Standby Power Systems*, Chapter 4, requirements for a Type 10, Class 24, Level 1 System. [**72:**10.6.11.3.1.1]

4.5.10.3.2 Installation of engine-driven generators used to provide secondary power for a [carbon monoxide detection] system shall be in accordance with *NFPA 70, National Electrical Code*, Article 700. [**72:**10.6.11.3.1.2]

4.5.10.4 Performance, Operation, Testing, and Maintenance. The requirements for performance, operation, testing, and maintenance of engine-driven generators shall conform to the applicable provisions of NFPA 110, *Standard for Emergency and Standby Power Systems*. [**72:**10.6.11.4]

4.5.10.5 Capacity. The unit shall be of a capacity that is sufficient to operate the system under the maximum normal load conditions in addition to all other demands placed upon the unit. [**72:**10.6.11.5]

4.5.10.6 Fuel. Unless otherwise required or permitted in 4.5.10.6.1 through 4.5.10.6.2, fuel shall be available in storage sufficient for 6 months of testing plus the capacity specified in 4.5.6. [**72:**10.6.11.6]

4.5.10.6.1 If a reliable source of supply is available at any time on a 2-hour notice, it shall be permitted to have fuel in storage sufficient for 12 hours of operation at full load. [**72:**10.6.11.6.2]

4.5.10.6.2 Fuel systems using natural or manufactured gas supplied through reliable utility mains shall not be required to have fuel storage tanks unless located in seismic risk zone 3 or greater as defined in ANSI A-58.1, *Building Code Requirements for Minimum Design Loads in Buildings and Other Structures*. [**72:**10.6.11.6.3]

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

4.5.10.7 Battery and Charger. A separate storage battery and separate automatic charger shall be provided for starting the engine-driven generator and shall not be used for any other purpose. [**72:**10.6.11.7]

4.6 Distinctive Signals.

4.6.1 Carbon monoxide alarm signals and carbon monoxide detection system supervisory and trouble signals shall be distinctively and descriptively annunciated.

4.6.2 Audible alarm notification appliances for a [carbon monoxide detection] system shall produce signals that are distinctive from other similar appliances used for other purposes in the same area that are not part of the [carbon monoxide detection] system. [**72:**10.10.2]

4.6.3* An audible notification appliance on a control unit, or on multiple control units that are interconnected to form a system, or at a remote location, shall be permitted to have the same audible characteristics for all alerting functions including, but not limited to, alarm, trouble, and supervisory, provided that the distinction between signals shall be by other appropriate means, such as visible annunciation. [**72:**10.10.4]

4.6.4* Supervisory signals shall be distinctive in sound from other signals, and their sound shall not be used for any other purpose except as permitted in 4.6.3. [**72:**10.10.5]

4.6.5 Trouble signals required to indicate at the protected premises shall be indicated by distinctive audible signals, which shall be distinctive from alarm signals except as permitted in 4.6.3. [**72:**10.10.6]

4.6.6 When a carbon monoxide detection system is combined with either a fire alarm system and/or an intrusion detection system, trouble signals from each system shall be permitted to use a common audible signal.

4.7 Alarm Signals.

4.7.1 Carbon monoxide alarm signals shall comply with 5.8.6.5.

4.7.2 An alarm signal that has been deactivated at the protected premises shall comply with 4.7.3.1 and 4.7.3.2. [**72:**10.12.6]

4.7.2.1 The audible and visible alarm signal at the control unit only shall automatically reactivate every 24 hours or less until alarm signal conditions are restored to normal. [**72:**10.12.6.1]

4.7.2.2 The audible and visible alarm signal shall operate until it is manually silenced or acknowledged. [**72:**10.12.6.2]

4.7.3 [Carbon Monoxide] Alarm Notification Appliance Deactivation.

4.7.3.1 A means for turning off activated alarm notification appliance(s) shall be permitted only if it complies with 4.7.3.3 through 4.7.3.7.

Exception: An initiating device with integral sounder shall be permitted to comply with 5.8.2.9.

4.7.3.2 When an occupant notification alarm signal deactivation means is actuated, both audible and visible notification appliances shall be simultaneously deactivated. [**72:**10.13.2]

4.7.3.3 The [carbon monoxide] alarm notification deactivation means shall be key-operated or located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use. [**72:**10.13.3]

4.7.3.4 The means shall comply with the requirements of 4.12.1. [**72:**10.13.4]

4.7.3.5 Subsequent actuation of initiating devices on other initiating device circuits or subsequent actuation of addressable initiating devices on signaling line circuits shall cause the notification appliances to reactivate.

Exception: Subsequent actuation of another addressable initiating device of the same type in the same room or space shall not be required to cause the notification appliance(s) to reactivate.

4.7.3.6 A [carbon monoxide] alarm notification deactivation means that remains in deactivation position when there is no alarm condition shall operate an audible trouble notification appliance until the means is restored to normal. [**72:**10.13.6]

4.7.3.7* Resetting of alarm signals shall comply with the requirements of 5.8.2.2. [**72:**10.13.4

4.8 Supervisory Signals.

4.8.1 Supervisory Signal Indication. Visible and audible indication of supervisory signals and visible indication of their restoration to normal shall be indicated within 90 seconds at the following locations:

(1) Control unit for local carbon monoxide detection systems
(2) Building command center for emergency voice/alarm communications systems
(3) Supervising station location for systems installed in compliance with Chapter 7

4.8.2 Self-Restoring Signal. A supervisory signal initiating device shall be permitted to be self-restoring provided the control panel continues to indicate the supervisory condition.

4.8.3 Supervisory Notification Appliance Location. The audible supervisory notification appliances shall be located in an area where they are likely to be heard. [**72:**10.14.5]

4.8.4 Supervisory Signal Reactivated. A supervisory signal that has been deactivated at the protected premises shall comply with 4.8.4.1 and 4.8.4.2. [**72:**10.14.6]

4.8.4.1 The audible and visible supervisory signal at the control unit only shall automatically reactivate every 24 hours or less until supervisory signal conditions are restored to normal. [**72:**10.14.6.1]

4.8.4.2 The audible and visible supervisory signal shall operate until it is manually silenced or acknowledged. [**72:**10.14.6.2]

4.8.5 Supervisory Notification Appliance Deactivation.

4.8.5.1 A means for deactivating a supervisory notification appliance(s) shall be permitted only if it complies with 4.8.5.2 through 4.8.5.5.

4.8.5.2 The means shall be key-operated or located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use. [**72:**10.14.7.2]

4.8.5.3 The means for deactivating supervisory notification appliances shall comply with the requirements of 4.12.2. [**72:**10.14.7.3]

4.8.5.4 Subsequent actuation of supervisory initiating devices in other building zones shall cause supervisory notification appliances to actuate as required by the system input/output matrix. [**72:**10.14.7.4]

4.8.5.5 A means for deactivating supervisory notification appliances that remain in the deactivated position when there is

AVA Documents 2015 Edition NFPA Document Sharing Hub
Full document details: NFPA 720 2015

no supervisory condition shall operate an audible trouble notification appliance until the means is restored to normal. [**72:**10.14.7.5]

4.9 Trouble Signals.

4.9.1 Trouble signals and their restoration to normal shall be indicated within 200 seconds at the locations identified in 4.9.7. [**72:**10.15.1]

4.9.2 Indication of primary power failure trouble signals transmitted to a supervising station shall be in accordance with 4.13.2.3. [**72:**10.15.2]

4.9.3 An audible trouble signal shall be permitted to be intermittent provided it sounds at least once every 10 seconds, with a minimum duration of ½ second. [**72:**10.15.3]

4.9.4 A single audible trouble signal shall be permitted to annunciate multiple fault conditions. [**72:**10.15.4]

4.9.5 The audible trouble notification appliances shall be located in an area where they are likely to be heard. [**72:**10.15.5]

4.9.6 Actuated notification appliances at the protected premises shall continue to operate unless they are manually silenced as permitted 4.9.9.1. [**72:**10.15.6]

4.9.7 Visible and audible trouble signals and visible indication of their restoration to normal shall be indicated at the following locations:

(1) Control unit for carbon monoxide detection systems
(2) Building command center for emergency voice/alarm communications systems
(3) Supervising stations for systems installed in compliance with Chapter 7

4.9.8* A trouble signal that has been deactivated at the protected premises shall comply with 4.9.8.1 and 4.9.8.2. [**72:**10.15.9]

4.9.8.1 The audible and visible trouble signal shall automatically reactuate at the control unit every 24 hours or less until trouble signal conditions are restored to normal. [**72:**10.15.9.1]

4.9.8.2 The audible and visible trouble signal associated with signaling the depletion or failure of the primary battery of a wireless system as required by 5.12.2(3) and 5.12.2(4) shall automatically resound every 4 hours or less until the depletion signal is restored to normal. [**72:**10.15.9.2]

4.9.9 Trouble Notification Appliances Deactivation.

4.9.9.1 A means for deactivating trouble notification appliance(s) shall be permitted only if it complies with 4.9.9.2 through 4.9.9.7.

4.9.9.2 The means shall be key-operated or located with a lock cabinet, or arranged to provide equivalent protection against unauthorized use. [**72:**10.15.10.2]

4.9.9.3 The means for deactivating trouble notification appliances shall comply with the requirements of 4.12.2. [**72:**10.15.10.3]

4.9.9.4 If an audible trouble notification appliances is also used to indicate a supervisory condition, as permitted by 4.6.3, a trouble notification appliance deactivation means shall not prevent subsequent actuation of supervisory notification appliances. [**72:**10.15.10.4]

4.9.9.5 Subsequent trouble signals shall cause trouble notification appliances to activate as required by the system input/output matrix. [**72:**10.15.10.5]

4.9.9.6 A means for deactivating trouble notification appliances that remains in the deactivated position when there is no trouble condition shall operate an audible trouble notification appliance until the means is restored to normal. [**72:**10.15.10.6]

4.9.9.7 Unless otherwise permitted by the authoring having jurisdiction, trouble notification appliances at the protected premises of a supervising station [ ] alarm system arranged in accordance with Chapter 7, that have been silenced at protected premises shall automatically reactuate every 24 hours or less until the fault conditions are restored to normal. [**72:**10.15.10.7]

4.10 [Carbon Monoxide] Control Function Status Indicators.

4.10.1 All controls provided specifically for the purpose of manually overriding any automatic [carbon monoxide] control function shall provide visible indication of the status of the associated control circuits. [**72:**10.16.1]

4.10.2* Where status indicators are provided for emergency equipment or [carbon monoxide] control functions, they shall be arranged to reflect the actual status of the associated equipment or function. [**72:**10.16.2]

4.11 Performance and Limitations.

4.11.1 Voltage, Temperature, and Humidity Variation. Equipment other than that addressed by 4.11.2.4 and 5.8.5.3.6 shall be designed so that it is capable of performing its intended functions under the following conditions:

(1)*At 85 percent and at 110 percent of the nameplate primary (main) and secondary (standby) input voltage(s)
(2) At ambient temperatures of 32°F (0°C) and 120°F (49°C)
(3) At a relative humidity of 85 percent and an ambient temperature of 86°F (30°C)

4.11.2 Installation and Design.

4.11.2.1* All systems shall be installed in accordance with the manufacturer's published installation instructions and applicable codes and standards.

4.11.2.2 Devices and appliances shall be located and mounted so that accidental operation or failure is not caused by vibration or jarring. [**72:**10.4.2]

4.11.2.3 All apparatus requiring [ ] resetting to maintain normal operation shall be restored to normal as promptly as possible after each abnormal condition and maintained in normal condition for operation. [**72:**10.3.4]

4.11.2.4 Equipment shall be installed in locations where conditions do not exceed the voltage, temperature, and humidity limits specified in the manufacturer's published instructions. [**72:**10.4.3]

4.12 Annunciation and Annunciation Zoning.

4.12.1 Alarm Annunciation.

4.12.1.1 The location of an actuated initiating device shall be annunciated by visible means.

4.12.1.2 Visible annunciation of the location of an operated initiating device shall be by an indicator lamp, alphanumeric display, printout, or other approved means. [**72:**10.18.1.1.1]

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

4.12.1.3 The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances. [**72:**10.18.1.1.2]

4.12.2 Supervisory and Trouble Annunciation.

4.12.2.1 Supervisory and/or trouble annunciation shall be annunciated by visible means.

4.12.2.2 Visible annunciation shall be by an indicator lamp, an alphanumeric display, a printout, or other means. [**72:**10.18.2.1.1]

4.12.2.3 The visible annunciation of supervisory and/or trouble conditions shall not be canceled by the means used to deactivate supervisory or trouble notification appliances. [**72:**10.18.2.1.2]

4.12.3* Annunciator Access and Location.

4.12.3.1 All required annunciation means shall be readily accessible to responding personnel. [**72:**10.18.3.1]

4.12.3.2 All required annunciation means shall be located as required by the authority having jurisdiction to facilitate an efficient response to the situation. [**72:**10.18.3.2]

4.12.4 Alarm Annunciation Display. Visible annunciators shall be capable of displaying all zones in alarm. [**72:**10.18.4]

4.12.4.1 If all zones in alarm are not displayed simultaneously, the zone of origin shall be displayed. [**72:**10.18.4.1]

4.12.4.2 If all zones in alarm are not displayed simultaneously, there shall be an indication that other zones are in alarm. [**72:**10.18.4.2]

4.12.5 Annunciation Zoning.

4.12.5.1 For the purpose of alarm annunciation, each floor of the building shall be considered as a separate zone. [**72:**10.18.5.1]

4.12.5.2 Where the system serves more than one building, each building shall be annunciated separately. [**72:**10.18.5.3]

4.13 Monitoring Integrity.

4.13.1* Monitoring Integrity and Circuit Performance of Installation Conductors and Other Signaling Channels.

4.13.1.1 Unless otherwise permitted or required by 4.13.1.3 through 4.13.1.10, all means of interconnecting equipment, devices, and appliances and wiring connections shall be monitored for the integrity of the interconnecting conductors or equivalent path so that the occurrence of a single open or a single ground-fault condition in the installation conductors or other signaling channels is automatically indicated within 200 seconds. [**72:**12.6.1]

4.13.1.2 Unless otherwise permitted or required by 4.13.1.3 through 4.13.1.10, all means of interconnecting equipment, devices, and appliances and wiring connections shall be monitored for the integrity of the interconnecting conductors or equivalent path so that the restoration to normal of a single open or a single ground-fault condition in the installation conductors or other signaling channels is automatically indicated within 200 seconds. [**72:**12.6.2]

4.13.1.3 Shorts between conductors shall not be required to be monitored for integrity, unless required by 4.13.1.14 or 4.13.1.15. [**72:**12.6.3]

4.13.1.4 Monitoring for integrity shall not be required for connections to and between supplementary system components, provided that single open, ground-fault, or short-circuit conditions of the supplementary equipment or interconnecting means, or both, do not affect the required operation of the [carbon monoxide detection] system. [**72:**12.6.5]

4.13.1.5 Monitoring for integrity shall not be required for the circuit of an alarm notification appliance installed in the same room with the central control equipment, provided that the notification appliance circuit conductors are installed in conduit or are equivalently protected against mechanical injury. [**72:**12.6.6]

4.13.1.6 Monitoring for integrity shall not be required for a trouble notification appliance circuit. [**72:**12.6.7]

4.13.1.7* Monitoring for integrity shall not be required for the interconnection between listed equipment within a common enclosure. [**72:**12.6.8]

4.13.1.8 Monitoring for integrity shall not be required for the interconnection between enclosures containing control equipment located within 20 ft (6 m) of each other where the conductors are installed in conduit or equivalently protected against mechanical injury. [**72:**12.6.9]

4.13.1.9 Monitoring for integrity shall not be required for the conductors for ground–fault detection where a single ground does not prevent the required normal operation of the system. [**72:**12.6.10]

4.13.1.10 Monitoring for integrity shall not be required for the interconnecting wiring of a stationary computer and the computer's keyboard, video monitor, mouse-type device, or touch screen, as long as the interconnecting wiring does not exceed 8 ft (2.4 m) in length; is a listed computer/data processing cable as permitted by *NFPA 70*, *National Electrical Code*; and failure of cable does not cause the failure of the required system functions not initiated from the keyboard, mouse, or touch screen. [**72:**12.6.13]

4.13.1.11 Interconnection means shall be arranged so that a single break or single ground–fault does not cause an alarm signal. [**72:**12.6.15]

4.13.1.12 Unacknowledged alarm signals shall not be interrupted if a fault on an initiating device circuit or a signaling line circuit occurs while there is an alarm condition on that circuit unless the faulted circuit is used to interconnect control units. [**72:**10.12.5]

4.13.1.13 An open, ground-fault, or short-circuit fault on the installation conductors of one alarm notification appliance circuit shall not affect the operation of any other alarm notification circuit for more than 200 seconds regardless of whether the short-circuit fault is present during normal or activated circuit state. [**72:**10.17.1]

4.13.1.13.1 Notification alarm circuits that do not have notification appliances connected directly to the circuit shall be considered control circuits. [**72:**10.17.2]

4.13.1.13.2 Control circuits shall not be required to comply with 4.13.1.13, provided that the circuit is monitored for integrity in accordance with 4.13.1 and a fault in the installation conductors shall result in a trouble signal in accordance with Section 4.9. [**72:**10.17.3]

AVA Documents 2015 Edition NFPA Document Sharing Hub

Full document details: NFPA 720 2015

4.13.1.14 A wire-to-wire short-circuit fault on any alarm notification appliance circuit shall result in a trouble signal in accordance with Section 4.9 and 4.9.7, except as permitted by 4.13.1.4 or 4.13.1.5. [**72:**12.6.16]

4.13.1.15 Where two or more systems are interconnected, the systems shall be connected using Class A, B, or X circuits as described in 5.4.3. [**72:**12.6.17]

4.13.2 Monitoring Integrity of Power Supplies.

4.13.2.1 Unless otherwise permitted or required by 4.13.2.1.3 through 4.13.2.1.6, all primary and secondary power supplies shall be monitored for the presence of voltage at the point of connection to the system. [**72:**10.6.9.1]

4.13.2.1.1 Failure of either supply shall result in a trouble signal in accordance with Section 4.9. [**72:**10.6.9.1.1]

4.13.2.1.2 Where the digital alarm communicator transmitter (DACT) is powered from a protected premises [carbon monoxide detection] control unit, power failure indication shall be in accordance with 4.13.2.1. [**72:**10.6.9.1.2]

4.13.2.1.3 Monitoring shall not be required for a power supply for supplementary equipment. [**72:**10.6.9.1.3]

4.13.2.1.4 Monitoring shall not be required for the neutral of a three-, four-, or five-wire alternating current (ac) or direct current (dc) supply source. [**72:**10.6.9.1.4]

4.13.2.1.5 Monitoring shall not be required for the main power supply in a central station, provided the fault condition is otherwise indicated so as to be obvious to the operator on duty. [**72:**10.6.9.1.5]

4.13.2.1.6 Monitoring shall not be required for the output of an engine-driven generator that is part of the secondary power supply, provided that the generator is tested weekly in accordance with Chapter 8. [**72:**10.6.9.1.6]

4.13.2.2* Power supply sources and electrical supervision for digital alarm communications systems shall be in accordance with Sections 4.5 and 4.13. [**72:**10.6.9.2]

4.13.2.3* Unless prohibited by the authority having jurisdiction, where carbon monoxide detection systems are connected to a supervising station, the system shall be arranged to delay transmission of primary power failure signals for a period ranging from 60 to 180 minutes.

4.13.2.4 Power supervisory devices shall be arranged so as not to impair the receipt of [carbon monoxide] alarm or supervisory signals. [**72:**10.6.9.4]

4.14 Documentation.

4.14.1 Approval and Acceptance.

4.14.1.1 The authority having jurisdiction shall be notified prior to installation or alteration of equipment or wiring. [**72:**10.20.2]

4.14.1.2* At the authority having jurisdiction's request, complete information regarding the system or system alterations, including specifications, type of system or service, shop drawings, input/output matrix, battery calculations, and notification appliance circuit voltage drop calculations, shall be submitted for approval.

4.14.1.3 Before requesting final approval of the installation, if required by the authority having jurisdiction, the installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements. [**72:**7.5.2]

4.14.1.4* The carbon monoxide detection system record of completion form, Figure 4.14.1.4, shall be permitted to be a part of the written statement required in 4.14.1.3.

4.14.1.4.1 When more than one contractor has been responsible for the installation, each contractor shall complete the portions of the form for which that contractor had responsibility.

4.14.2 Completion Documents.

4.14.2.1 Preparation.

4.14.2.1.1* The preparation of a carbon monoxide detection system record of completion, Figure 4.14.1.4, shall be the responsibility of the qualified and experienced person described in 4.4.2.

4.14.2.1.2 The preparation of a carbon monoxide detection system record of completion, Figure 4.14.1.4, shall be in accordance with 4.14.2.1.2.1 through 4.14.2.1.2.5.

4.14.2.1.2.1 Parts 1 through 14 of the record of completion shall be completed after the system is installed and the installation wiring has been checked.

4.14.2.1.2.2 Parts 15 and 16 of the record of completion shall be completed after the operational acceptance tests have been completed.

4.14.2.1.2.3 A preliminary copy of the record of completion shall be given to the system owner and, if requested, to other authorities having jurisdiction after completion of the installation wiring tests.

4.14.2.1.2.4 A final copy of the record of completion shall be provided after completion of the operational acceptance tests.

4.14.2.1.2.5 One copy of the record of completion shall be stored at the carbon monoxide detection control unit or other approved location.

4.14.2.1.2.6 This copy shall be updated to reflect all system additions or modifications and maintained in a current condition at all times.

4.14.2.1.2.7 Where not stored at the main carbon monoxide detection control unit, the location of these documents shall be identified at the main fire alarm control unit.

4.14.2.1.2.8 If the documents are located in a separate enclosure or cabinet, the separate enclosure or cabinet shall be prominently labeled CARBON MONOXIDE DETECTION DOCUMENTS.

4.14.2.2 Revision. All [carbon monoxide detection] system modifications made after the initial installation shall be recorded on a revised version of the original [record of completion]. [**72:**7.5.6.6.1]

4.14.2.2.1 All changes from the original information shall be shown.

4.14.2.2.2 The revised record of completion shall include a revision date.

AVA Documents Document Sharing Hub

Full document details: NFPA 720 2015

CARBON MONXIDE SYSTEM RECORD OF COMPLETION

To be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to provide a complete record.

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

Description of property: _____

Occupancy type: _____

Name of property representative: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Authority having jurisdiction over this property: _____

Phone: _____ Fax: _____ E-mail: _____

2. INSTALLATION, SERVICE, AND TESTING CONTRACTOR INFORMATION

Installation contractor for this equipment: _____

Address: _____

License or certification number: _____

Phone: _____ Fax: _____ E-mail: _____

Service organization for this equipment: _____

Address: _____

License or certification number: _____

Phone: _____ Fax: _____ E-mail: _____

A contract for test and inspection in accordance with NFPA standards is in effect as of: _____

Contracted testing company: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Contract expires: _____ Contract number: _____ Frequency of routine inspections: _____

3. DESCRIPTION OF SYSTEM OR SERVICE

❑ Carbon monoxide system (nonvoice)

❑ Carbon monoxide emergency voice alarm communication system (EVACS)

❑ Combination carbon monoxide detection system, with the following components, describe: _____

_____

_____

NFPA 720 edition: _____ Additional description of system(s): _____

_____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 Carbon Monoxide Detection System Record of Completion.

AVA Documents 2015 Edition Document Sharing Hub
Full document details: NFPA 720 2015

3. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

3.1 Control Unit

Manufacturer: _____ Model number: _____

3.2 System Documentation

❑ An owner's manual, a copy of the manufacturer's instructions, a written sequence of operation, and a copy of the numbered record drawings are stored on site. Location: _____

3.3 System Software

❑ This system does not have alterable site-specific software.

Operating system (executive) software revision level: _____

Site-specific software revision date: _____ Revision completed by: _____

❑ A copy of the site-specific software is stored on site. Location: _____

3.4 Off-Premises Signal Transmission

❑ This system does not have off-premises transmission.

Name of organization receiving alarm signals with phone numbers:

Alarm: _____ Phone: _____

Supervisory: _____ Phone: _____

Trouble: _____ Phone: _____

Entity to which alarms are retransmitted: _____ Phone: _____

Method of retransmission: _____

Specify the means of transmission from the protected premises to the supervising station or receiving station:

_____

4. CIRCUITS AND PATHWAYS

4.1 Signaling Line Pathways

4.1.1 Pathways Class Designations

Pathways class: _____ Quantity: _____

(See NFPA 720, 5.4.3.)

4.1.2 Pathways Utilizing Two or More Media

Quantity: _____ Description: _____

_____

4.1.3 Device Power Pathways

❑ No separate power pathways from the signaling line pathway

❑ Power pathways are separate but of the same pathway classification as the signaling line pathway

❑ Power pathways are separate and different classification from the signaling line pathway

4.1.4 Isolation Modules

Quantity: _____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 *Continued*

Documents
Document Sharing Hub
Full document details: NFPA 720 2015

4. CIRCUITS AND PATHWAYS *(continued)*

4.2 Alarm Initiating Device Pathways

4.2.1 Pathways Class Designations

Pathways class: _____ Quantity: _____

(See NFPA 720, 5.4.3.)

4.2.2 Pathways Utilizing Two or More Media

Quantity: _____ Description: _____

4.2.3 Device Power Pathways

❑ No separate power pathways from the initiating device pathway

❑ Power pathways are separate but of the same pathway classification as the initiating device pathway

❑ Power pathways are separate and different classification from the initiating device pathway

4.3 Non-Voice Audible System Pathways

4.3.1 Pathways Class Designations

Pathways class: _____ Quantity: _____

(See NFPA 720, 5.4.3.)

4.3.2 Pathways Utilizing Two or More Media

Quantity: _____ Description: _____

4.3.3 Device Power Pathways

❑ No separate power pathways from the notification appliance pathway

❑ Power pathways are separate but of the same pathway classification as the notification appliance pathway

❑ Power pathways are separate and different classification from the notification appliance pathway

5. ALARM INITIATING DEVICES

5.1 Automatic Initiating Devices

5.1.1 Carbon Monoxide Detectors

Type and number of devices: Addressable: _____ Conventional: _____

Other (specify): _____

Type of detector sensing technology: ❑ Electrochemical ❑ Biomimetic ❑ Metal oxide semiconductor (MOS)

Other (specify): _____

5.1.2 Addressable Monitoring Modules

❑ This system does not have monitoring modules.

Number of devices: _____

5.1.3 Other Initiating Devices

❑ This system does have other initiating devices.

Describe: _____

6. SUPERVISORY SIGNAL–INITIATING DEVICES

6.1 Supervisory Devices

❑ This system does not have supervisory devices.

Type and number of devices: Addressable: _____ Conventional: _____ Coded: _____ Transmitter: _____

Describe: _____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 *Continued*

AVA Documents 2015 Edition Document Sharing Hub

Full document details: NFPA 720 2015

7. ANNUNCIATORS

❑ This system does not have annunciators.

7.1 Location and Description of Annunciators

Location 1: _____

Location 2: _____

Location 3: _____

8. ALARM NOTIFICATION APPLIANCES

8.1 Emergency Voice Alarm Communication System

❑ This system does not have an EVACS.

Number of single voice alarm channels: _____ Number of multiple voice alarm channels: _____

Number of speakers: _____ Number of speaker circuits: _____

Location of amplification and sound-processing equipment: _____

Location of paging microphone stations:

Location 1: _____

Location 2: _____

Location 3: _____

8.2 Nonvoice Notification Appliances

❑ This system does not have nonvoice notification appliances.

Horns: _____ With visible: _____ Bells: _____ With visible: _____

Chimes: _____ With visible: _____

Visible only: _____ Other (describe): _____

8.3 Notification Appliance Power Extender Panels

❑ This system does not have power extender panels.

Quantity: _____

Locations: _____

9. CARBON MONOXIDE SAFETY FUNCTIONS

This system activates the following control functions: _____

_____

Describe: _____

9.1 Addressable Control Modules

❑ This system does not have control modules.

Number of devices: _____

Other (specify): _____

10. SYSTEM POWER

10.1 Control Unit

10.1.1 Primary Power

Input voltage of control panel: _____ Control panel amps: _____

Overcurrent protection: Type: Amps: _____

Location (of primary supply panel board):

Disconnecting means location: _____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 *Continued*

Documents Document Sharing Hub

Full document details: NFPA 720 2015

10. SYSTEM POWER *(continued)*

10.1.2 Engine-Driven Generator ❑ This system does not have a generator.

Location of generator: _____

Location of fuel storage: _____ Type of fuel:

10.1.3 Uninterruptible Power System ❑ This system does not have a UPS.

Equipment powered by a UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

10.1.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

❑ Batteries are marked with date of manufacture ❑ Battery calculations are attached

10.2 Emergency Voice Alarm Communication System

❑ This system does not have an EVACS.

10.2.1 Primary Power

Input voltage of EVACS panel: _____ EVACS panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panel board): _____

Disconnecting means location: _____

10.2.2 Engine-Driven Generator ❑ This system does not have a generator.

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

10.2.3 Uninterruptible Power System ❑ This system does not have a UPS.

Equipment powered by a UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

10.2.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

❑ Batteries are marked with date of manufacture ❑ Battery calculations are attached

10.3 Notification Appliance Power Extender Panels

❑ This system does not have power extender panels

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 *Continued*

AVA Documents 2015 Edition Document Sharing Hub

Full document details: NFPA 720 2015

10. SYSTEM POWER *(continued)*

10.3.1 Primary Power

Input voltage of power extender panel(s): _____ Power extender panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panel board): _____

Disconnecting means location: _____

10.3.2 Engine-Driven Generator

❑ This system does not have a generator.

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

10.3.3 Uninterruptible Power System

❑ This system does not have a UPS.

Equipment powered by a UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

10.3.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

❑ Batteries are marked with date of manufacture ❑ Battery calculations are attached

11. RECORD OF SYSTEM INSTALLATION

Fill out after all installation is complete and wiring has been checked for opens, shorts, ground faults, and improper branching, but before conducting operational acceptance tests.

This is a: ❑ New system ❑ Modification to an existing system Permit number: _____

The system has been installed in accordance with the following requirements: (Note any or all that apply.)

❑ NFPA 720, Edition: _____

❑ *NFPA 72,* Edition: _____

❑ *NFPA 70, National Electrical Code,* Article 760*,* Edition: _____

❑ Manufacturer's published instructions

Other (specify): _____

_____

System deviations from referenced NFPA standards: _____

_____

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 ***Continued***

Documents Document Sharing Hub

Full document details: NFPA 720 2015

12. RECORD OF SYSTEM OPERATONAL ACCEPTANCE TEST

❑ New system

All operational features and functions of this system were tested by, or in the presence of, the signer shown below, on the date shown below, and were found to be operating properly in accordance with the requirements for the following:

❑ Modifications to an existing system

All newly modified operational features and functions of the system were tested by, or in the presence of, the signer shown below, on the date shown below, and were found to be operating properly in accordance with the requirements of the following:

❑ NFPA 720, Edition: _____

❑ *NFPA 72,* Edition: _____

❑ *NFPA 70, National Electrical Code,* Article 760, Edition: _____

❑ Manufacturer's published instructions

Other (specify): _____

_____

❑ Individual device testing documentation [Inspection and Testing Form (Figure 8.6.2.2) is attached]

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

13. CERTIFICATIONS AND APPROVALS

13.1 System Installation Contractor:

This system, as specified herein, has been installed and tested according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

13.2 System Service Contractor:

The undersigned has a service contract for this system in effect as of the date shown below.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

13.3 Supervising Station:

This system, as specified herein, will be monitored according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

© 2014 National Fire Protection Association

FIGURE 4.14.1.4 ***Continued***

AVA Documents 2015 Edition Document Sharing Hub

Full document details: NFPA 720 2015