



**SALEM FIRE DEPARTMENT  
BUREAU OF FIRE PREVENTION  
152 MAIN STREET  
SALEM, NEW HAMPSHIRE 03079  
BUSINESS: (603) 890-2200  
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**JEFFREY S. EMANUELSON  
FIRE MARSHAL**

## **Fire Alarm Rules and Regulations**

- Chapter 1: General requirements
- Chapter 2: Design requirements
- Chapter 3: Equipment
- Chapter 4: Wiring
- Chapter 5: System acceptance
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- Chapter 7: Renovations or additions

Adopted: April 1, 1990  
Revised / Effective: April 3, 2008

## **CHAPTER 1 GENERAL REQUIREMENTS**

### **1-1 GENERAL REQUIREMENTS**

- 1-1.1 In accordance with section 1-4.4.1 of the Salem Fire Prevention Code Ordinance of 2000, as adopted by the town, the following regulations are hereby adopted.
- 1-1.2 The following new and existing buildings shall be required to install and maintain an automatic fire alarm system in accordance with these requirements:
- 1-1.2.1 All buildings or portions thereof, classified as Place of Assembly Occupancies with an occupant load of 100 or more people.
  - 1-1.2.2 All buildings or portions thereof, classified as Educational Occupancies which shall include Day-Care Centers with more than 50 clients.
  - 1-1.2.3 All buildings or portions thereof, classified as Health Care Occupancies which shall include ambulatory health care.
  - 1-1.2.4 All buildings or portions thereof, classified as Detentional or Correctional Occupancies.
  - 1-1.2.5 All buildings, or portions thereof, classified as Hotels or Dormitories.
  - 1-1.2.6 All buildings, or portions thereof, classified as Apartments which have more than two (2) living units and/or are more than two stories in height.
  - 1-1.2.7 All buildings, or portions thereof, classified as Lodging and/or Rooming Houses.
  - 1-1.2.8 All buildings, or portions thereof, classified as Residential Board and Care Occupancies.
  - 1-1.2.9 All buildings, or portions thereof, classified as Mercantile Occupancies which have more than 2,999 square feet of gross floor space.

- 1-1.2.10 All buildings, or portions thereof, classified as Business Occupancies which are two or more stories in height, including basements which are used for business purposes, such as office and storage space, or which have more than 2,999 square feet of gross floor space.
  - 1-1.2.11 All buildings, or portions thereof, classified as Industrial Occupancies which have more than 2,999 square feet of gross floor area and/or are more than two stories in height, including basements.
  - 1-1.2.12 All buildings, or portions thereof, classified as Storage Occupancies which have more than 2,999 square feet of gross floor space.
  - 1-1.2.13 All buildings, or portions thereof, which in the opinion of the authority having jurisdiction are a High Hazard Occupancy.
  - 1-1.2.14 All buildings which are protected with automatic sprinkler systems, excluding 1 & 2 family homes.
- 1-1.3 All building classifications shall be determined in accordance with the National Fire Protection Association, Life Safety Code, and NFPA 101.
- 1-1.4 The owner, operator, or occupant of any building shall be responsible for compliance with these regulations. For condominiums, the condominium association shall be responsible for compliance with these regulations. Where the phrase "property owner" is used throughout these regulations, it is intended to include any person(s) identified in this section (1-1.4).

## **1-2 PURPOSE**

- 1-2.1 The purpose of these regulations is to insure that all fire alarm systems installed within the Town of Salem, New Hampshire are designed, installed and maintained to achieve a high degree of reliability.
- 1-2.2 The provisions of these regulations are not intended to prevent the use of any material or method of work not specifically prescribed by these regulations provided such alternative has been approved by the authority having jurisdiction.
- 1-2.3 These regulations are intended for use by persons knowledgeable in the design, installation, use, and maintenance of fire alarm systems.

### **1-3 APPLICABILITY**

1-3.1 These regulations shall apply to the installation of any new fire alarm system, modification, or maintenance to existing fire alarm systems within the Town of Salem, New Hampshire. (See Chapter 7)

### **1-4 PERMITS**

1-4.1 Before any fire alarm system is installed, enlarged, extended, or modified in any way; a permit shall be obtained from the Bureau of Fire Prevention.

### **1-5 INSTALLER CERTIFICATION**

1-5.1 Any Fire Alarm Technician installing, making modifications, or maintaining any fire alarm system in the Town of Salem, New Hampshire shall hold a valid and current Certificate of Fitness issued by the Salem Fire Department.

### **1-6 KNOX-BOX ®**

1-6.1 All buildings equipped with a fire alarm system which transmits directly to the Salem, New Hampshire Fire Rescue Department, shall be provided with a key box which will facilitate rapid entry for fire suppression personnel.

1-6.2 All rapid entry key boxes shall be a type manufactured by:

#### **THE KNOX COMPANY**

Applications shall be obtained from the Salem Fire Department Bureau of Fire Prevention. All completed orders and payment shall be submitted by the applicant to the Knox Company with shipment to be received by the applicant. The Salem Fire Department is not responsible for any orders or shipments.

### **1-7 OPERATING INSTRUCTIONS**

1-7.1 All fire alarm systems shall have complete operating instructions permanently mounted adjacent to the control panels. There shall be no special passwords, codes or keys required to operate the panel with the exception of enabling or disabling of devices.

### **1-8 EMERGENCY CONTACTS**

1-8.1 Any building/occupancy within the Town of Salem that has a fire alarm system, connected to the fire department communication center, is required to submit to the communication supervisor, a list of no less than three (3)

persons, who are key holders to the building. In addition to the persons named, after hours telephone numbers and/or pager numbers shall be submitted for after hours emergency notification purposes.

## **1-9 ELEVATORS**

- 1-9.1 All buildings that contain elevators shall comply with this section.
- 1-9.2 All elevators shall have installed a 3502 key cylinder for Firefighter Phase I and II operation. All smoke detectors used for elevator recall must be system connected smokes. Heat detectors used for shunt trip need not be system connected.
- 1-9.3 All elevators shall be of sufficient size to fit a Salem Fire Rescue ambulance/medical cot (while in the supine position). Where there is more than one elevator in a building, at least one must meet these criteria. At the discretion of the Chief of the Bureau, more than one may have to meet these criteria.
- 1-9.4 The 3502 key must be in the Knox Box.
- 1-9.5 See ASME A17.1 for additional criteria.
- 1-9.6 All initiating devices shall recall all elevators to the primary recall floor.
- 1-9.7 The lobby smoke detector of the primary recall floor shall recall the elevator to the secondary recall floor.
- 1-9.8 Secondary recall floor to be determined by the Salem Fire Department Bureau of Fire Prevention.

## SYSTEM DESIGN REQUIREMENTS

### 2-1 GENERAL

2-1.1 All fire alarm systems within the Town of Salem, New Hampshire, shall be designed, installed, and maintained in accordance with the most recent edition of the following National Fire Protection Association standards: 1, 70, 72, 90A, 90B, 92A, and 101.

### 2-2 PLANS

2-2.1 Two complete sets of design plans shall be submitted to the Bureau of Fire Prevention for review prior to the issuance of any permits.

2-2.2 All plans submitted for review shall include the following:

2-2.2.1 Accurate floor plans with dimensions which show all device, control panel, and transmitter locations.

2-2.2.2 Wiring riser diagrams.

2-2.2.3 Complete equipment list showing manufacture, make, type, and all listings and approvals of all proposed equipment.

2-2.2.4 Battery type and calculations.

2-2.2.5 Zone designations or device addresses shall be indicated.

2-2.2.6 Any mechanical considerations such as the need for duct smoke detection, fire/smoke dampers, smoke control features, and placement of detectors in relation to supply, return, and exhaust ducts.

2-2.3 Any change to previously approved plans shall be resubmitted for approval by the Bureau of Fire Prevention. Failure to have changes approved will be cause for system denial.

### 2-3 ZONING

2-3.1 No single fire alarm zone shall protect any area greater than 5,000 square feet unless approved by the Bureau of Fire Prevention.

2-3.2 All buildings with multiple tenants shall be zoned by tenant spaces.

2-3.3 All floors or stories of buildings shall be zoned independently. No zone shall be permitted to protect multiple floors.

2-3.4 Heating, ventilating, and air conditioning units shall be zoned and

annunciated independently or in zones containing groups of adjacent heating, ventilating, and air conditioning units.

2-3.5 All sprinkler system flow switches shall be zoned independently. No sprinkler zone shall contain more than one flow switch.

2-3.6 All concealed detection devices, such as under floor detectors, shall be zoned and annunciated independently. Further there shall be a visual indicator device located above the door to the room in which the device is located. This device shall indicate red upon activation and shall reset upon resetting of the fire alarm system. It shall have a permanent label indicating the type of device located within.

## **2-4 SMOKE DETECTION IN HVAC UNITS**

2-4.1 In accordance with National Fire Protection Association standard 90A, duct smoke detection shall be installed in any HVAC system of over 2,000 CFM capacity.

2-4.2 All smoke detectors installed into HVAC units upon activation shall automatically shut the unit down as well as activate the building's fire alarm system.  
(See Chapter 3-9 for additional requirements)

## **2-5 MANDATORY SMOKE DETECTION LOCATIONS**

2-5.1 **In all buildings equipped with automatic sprinkler systems:** Smoke detection shall be provided within the following areas (at a minimum): all enclosed stairwells; electric rooms; over the fire alarm panel; elevator shafts, lobbies, and machine rooms; and all corridors used as a means of egress from multiple tenant/owner spaces.

2-5.2 **In all buildings without automatic sprinkler systems:** Smoke detection shall be provided within the following areas (at a minimum): all stairways; electric rooms; elevator shafts, lobbies, and machine rooms; over the fire alarm panel; and corridors used as a means of egress.

## **2-6 AUTOMATIC FIRE SUPPRESSION SYSTEMS**

2-6.1 All automatic fire suppression systems shall be connected to the fire alarm system on an independent zone.

## **2-7 DEVICE MOUNTING**

2-7.1 All detection, initiating, and indicating devices shall be securely mounted onto back boxes.

## **CHAPTER 3 EQUIPMENT**

### **3-1 GENERAL**

- 3-1.1 All equipment used for any fire alarm system shall be UL® listed and/or FM® approved for such installation.
- 3-1.2 All equipment used for any fire alarm system shall be new and of current manufacture. No used or rebuilt equipment will be accepted.
- 3-1.3 All equipment shall be of the same manufacturer or compatible with other equipment within the system. Documentation showing that the devices are compatible shall be submitted with the plans for review.
- 3-1.4 Two conductor pigtail devices are not acceptable for installation except when device supervision is accomplished by means other than at the points of connection (e.g. addressable system detectors).
- 3-1.5 All equipment shall be capable of outputting individual zones to the required radio box transmitter.

### **3-2 RADIO TRANSMITTERS**

- 3-2.1 All fire alarm systems shall be directly connected to the Salem Fire Department through the use of an approved radio transmitter only.
- 3-2.2 The following radio transmitter manufacturers have been approved by the Salem Fire Department:
  - 1. King-Fisher Company  
2350 Foster Avenue  
Wheeling, Illinois 60090-6574  
(847)398-7100
  - 2. Digitize, Inc.  
158 Edison Road  
Lake Hopatcong, NJ 07849  
(973) 663-1011
- 3-2.2 All radio transmitters shall be capable of transmitting individual zones to the fire alarm receiver, unless otherwise approved by the authority having jurisdiction. All outputs shall be momentary (non-latching) in nature to allow for multiple zone transmission.

3-2.3 Keys for all radio transmitters shall be provided within the Knox box.

3-2.4 Transmitter keys shall be either 211 or cat 1.

### **3-3 CONTROL PANELS**

3-3.1 All fire alarm control panels shall be stand alone units. No other functions, such as security systems, shall be incorporated within the panel.

3-3.2 All control panels shall have a supervised means of zone/device disconnection or zone/device isolation.

3-3.3 All panels shall have a fire alarm drill switch. Activation of the drill switch shall not prevent the reception of an actual alarm, and shall not transmit an alarm to the Fire Department.

3-3.4 Upon activation of any alarm device, the control panel shall sound the evacuation signals, flash the evacuation lights, indicate the zone/device of activation, and transmit the signal to the Fire Department. This shall occur without manual intervention.

3-3.5 All control panels shall be capable of silencing the evacuation signal without resetting the alarm.

3-3.6 All conventional control panels shall have zone labeling, in plain English, permanently attached. This labeling shall be visible with the door both in the open and closed position. All addressable control panels shall have the device address list permanently affixed at the panel. All addressable control panels shall have an eighty (80) character (or greater) LCD display.

3-3.7 All control panels shall have auxiliary alarm (dry) contacts for each zone. A minimum of four sets of dry contacts shall be provided in all panels.

3-3.8 City disconnect switches are allowed on fire alarm control panels when connected to master boxes (existing systems only).

3-3.9 Keys for control panels shall be provided in the Knox box.

3-3.10 All control panels and devices with the exception of the radio transmitter will have Cat 30 key lock cylinders installed in place of the manufacturer's cylinder. All panel functions shall be protected by this locking mechanism.

3-3.11 All control panels shall be equipped with a "strobe off" function to allow the panel to be left in the alarm condition if the initiating device cannot be reset by the incident commander. Subsequent alarm(s) will then be

allowed to transmit as normal.

### **3-4 INTERFACE PANELS**

3-4.1 All interface panels or combination transmitter/interface panels shall be mounted adjacent to the fire alarm control panel.

3-4.2 Keys for all interface panels shall be provided in the Knox box.

### **3-5 REMOTE ANNUNCIATORS**

3-5.1 All fire alarm systems shall have remote annunciators. The type and location of the remote annunciator will be determined by the authority having jurisdiction after a review of the system design and building configuration. If an inside LCD type annunciator is approved, a red outside strobe light must be installed.

3-5.2 All remote annunciators shall contain visual and audible indicators for both system troubles and system alarms. All controls shall be at the fire alarm control panel only.

### **3-6 SMOKE DETECTORS**

3-6.1 All smoke detectors shall be photoelectric type devices unless otherwise approved in writing by the authority having jurisdiction.

3-6.2 Smoke detectors shall not be installed until final surface finish is complete on floors, walls, and ceilings.

3-6.3 Smoke detectors found to be prematurely installed shall be permanently marked by the Salem Fire Department and will be considered unacceptable for use in the fire alarm system. Factory shipping covers are unacceptable for dust covers.

### **3-7 MANUAL PULL STATIONS**

3-7.1 All manual pull stations connected to fire alarm systems shall be dual action type only.

3-7.2 All manual pull stations shall be resettable by use of a cat 30 key only. Cat 30 keys for pull stations shall be provided in the Knox box.

3-7.3 Manual pull stations shall be installed in accordance with the Americans with Disabilities Act. This shall include, but is not limited to, height and location. Deviations must be approved by the authority having jurisdiction.

3-7.4 Approved tamper covers shall be installed over the pull stations at the direction or request of the Bureau of Fire Prevention.

### **3-8 AUDIO/VISUAL DEVICES**

- 3-8.1 Fire Evacuation signaling devices shall be horn/voice and strobe light combination units and shall be installed in accordance with the Americans with Disabilities Act. This shall include, but is not limited to, height, location, and synchronization. Deviations must be approved by the authority having jurisdiction.
- 3-8.2 Fire evacuation signaling devices shall be easily recognized as fire warning devices.
- 3-8.3 The evacuation strobe lights shall have one (1) inch high letters of a contrasting color which shall read "Fire". The color of the strobe shall be white or clear to meet ADA and NFPA requirements.

### **3-9 DUCT SMOKE DETECTION**

- 3-9.1 Duct type smoke detectors shall be compatible with and installed accordance with the manufacturer's specifications.
- 3-9.2 Each duct smoke detector shall have a remote "test/reset alarm indicator" panel located at the FACP, and shall be accessible at all times.
- 3-9.3 The duct smoke detector remote test feature shall cause alarm by simulating an actual smoke condition within the detector.
- 3-9.4 Keys for the remote test/reset panels shall be provided in the Knox box.
- 3-9.5 Duct smoke detector locations and associated equipment shall be permanently labeled.
- 3-9.6 Roof top HVAC units which have duct smoke detection shall be permanently labeled on two opposite sides with numbers of at least six (6) inches high and of contrasting color.
- 3-9.7 All access panels shall be permanently labeled "Duct Smoke Detector Inside". The letters shall be a minimum of one (1) inch high and of a contrasting color.
- 3-9.8 All remote indicating panels shall be labeled with the associated HVAC unit number.
- 3-9.9 HVAC units located within the space between the ceiling and floor or room shall be permanently labeled in a manner approved by the Salem Fire Department.
- 3-9.10 All duct smoke detectors shall be marked on a floor plan of the building and permanently affixed at the fire alarm control panel.
- 3-9.11 All duct smoke detectors shall be powered from the fire alarm control

- panel. Detectors powered from any other source are unacceptable.
- 3-9.12 All duct smoke detectors shall reset automatically with the fire alarm system without any further intervention from Fire Department personnel.

## **CHAPTER 4 WIRING**

### **4-1 GENERAL REQUIREMENTS**

- 4-1.1 All fire alarm system initiating and notification appliance circuits shall be wired in accordance with NFPA 72.
- 4-1.2 The minimum acceptable wire size for initiating and notification appliance circuits shall be No. 16 AWG-solid.
- 4-1.3 All wiring shall be run in EMT or other approved conduit, with exception to 105 degree centigrade wire providing it is not exposed, is above ten (10) feet from the floor level and is supported every eighteen (18) inches. EMT or conduit containing fire alarm wire that is not "FPL" shall be painted red every six feet.
- 4-1.4 All 105 C fire alarm cable shall be labeled "FPL" or "FPLR" if the cable runs vertically between floors and "FPLP" if the cable runs in a plenum.
- 4-1.5 All 105 degree Centigrade wiring shall be color coded. The initiating circuits being red, all notification appliance circuits being black, all device power wiring being white and all other auxiliary wiring being gray.
- 4-1.6 All pull box covers shall be painted red.
- 4-1.7 All splice connections should be made with crimp type caps. Wire nuts, when used, shall be of the appropriate type and size. No more than two (2) wires will be allowed under either type of splice connection device.
- 4-1.8 All wiring shall be completed in a workman-like manner. All wiring within the control panel shall be neat and orderly; un-neat or disorderly wiring will be cause for system denial.
- 4-1.9 All wiring shall comply with NFPA 70 and NFPA 72.

### **4-2 CONTROL PANEL POWER**

- 4-2.1 The A/C power for the fire alarm control panel shall be fed from separate branch circuit. The breaker supplying this branch circuit shall be securely locked at all times.
- 4-2.1 The electrical panel housing the branch circuit supplying power to the fire alarm equipment shall be clearly labeled on the front of the panel with ½

inch high letters of contrasting color (preferably red) "Fire Alarm Circuit # xx". The FACP shall have this information on the inside front cover.

## **CHAPTER 5 SYSTEM ACCEPTANCE**

### **5-1 GENERAL**

- 5-1.1 All fire alarm systems shall pass an acceptance test by the Salem Fire Department prior to connection to the Fire Department's Fire Alarm Office.
- 5-1.2 Prior to the acceptance test, the system installer shall complete a certificate stating that the system has been 100% tested and functions in complete compliance with the system specifications, the manufacturer's recommendations, and these regulations. This certificate shall be signed by the installer, the general contractor, and/or the property owner, and shall be submitted to and received by the Salem Fire Department no less than 24 hours prior to the appointed time of the acceptance test. Failure to do so shall be cause for cancellation and failure of the acceptance test.
- 5-1.3 Any exception to 5-1.2 shall be obtained in advance from the Fire Marshall.
- 5-1.4 The acceptance test shall include the testing of all devices, wiring, and control panels within the system.
- 5-1.5 The system installer shall provide all necessary personnel and equipment to complete the testing. Fire Department personnel will not perform any function involved with the testing procedure.

## **CHAPTER 6 SYSTEM MAINTENANCE**

### **6-1 GENERAL**

- 6-1.1 The property owner is responsible to maintain the fire alarm system and all devices attached thereto, in proper working order at all times.
- 6-1.2 All maintenance to fire alarm systems shall be done by competent Certificate of Fitness holders who are knowledgeable in the system.

### **6-2 ROUTINE TESTING, INSPECTIONS, AND REPORTING**

- 6-2.1 The property owner is responsible to have 100% of the system tested and inspected annually (at a minimum).

- 6-2.2 The property owner shall maintain written reports of each annual test. The property owner shall provide to the Bureau of Fire Prevention copies of such reports upon completion of the test.
- 6-2.3 The Certificate of Fitness holder shall be allowed to call the Salem Fire Alarm Office and put the fire alarm system on "test". In doing so, any trouble alarms received in the Fire Alarm Office will be disregarded. The Certificate of Fitness Holder shall remain at the site at all times and keep a fire watch. If any problem develops, he/she shall call the FAO via 911 and advise of the emergency situation. If the card holder is going to send the box into Fire Alarm, he/she must notify Fire Alarm of his intentions immediately prior to sending the alarm in. If the card holder trips the system accidentally (without notifying the FAO), he/she shall call the FAO immediately. If the system trips into the FAO and it was not caused by the card holder, he/she will call the FAO and report the activation so a full response call is sent. When the work is complete, the Certificate of Fitness holder MUST call back and report the system is "off test". Failure to follow this procedure will result in the revocation of his/her fitness card.
- 6-2.4 The Certificate of Fitness holder shall send the alarm through to the Fire Alarm Office when conducting an annual test/inspection.
- 6-2.5 Short arms and test plug devices for master boxes are not allowed to be used at any time unless express written permission is given by the Salem Fire Department.

### **6-3 NEEDLESS ALARMS / NUISANCE ALARMS**

- 6-3.1 Any detection device which activates without cause, on the first occurrence shall be permanently marked by the Fire Department with a single line. On any other activation by this detector without cause, it shall again be marked with another line forming an "X". At that time, this detector is considered unacceptable and must be immediately replaced.
- 6-3.2 Any building causing more than one Fire Department Emergency Response in any 30 calendar day period due to faulty system or devices will be charged a nuisance fee. Said fee shall be established by the Board of Selectmen

**CHAPTER 7  
RENOVATIONS OR ADDITIONS**

**7-1 GENERAL**

- 7-1.1 Whenever an existing building or structure is enlarged, extended, or modified greater than 25% of the total existing area of the building or structure, the entire building or structure shall be upgraded to comply with current requirements in place for new construction.
  
- 7-1.2 Whenever an existing building or structure is enlarged, extended, or modified and the estimated cost of the job as declared on the building permit issued for the job from the Town of Salem is greater than 25% of the total assessed value of the building or structure, the entire building or structure shall be upgraded to comply with these requirements.
  
- 7-1.3 For the purposes of Chapter 7, any work done on buildings within a twelve month period of time shall be taken into consideration when calculating area, renovations, building permit fees, etc.

These Fire Alarm Regulations are issued on the order of:

\_\_\_\_\_ on \_\_\_\_\_  
Jeffrey S. Emanuelson, Fire Marshal Date  
Salem Fire Department - Bureau of Fire Prevention