

## FIRE ALARM SYSTEMS

### PART ONE: BASIC SYSTEMS

With the heightened awareness of life safety issues in buildings today, the basic fire alarm system is evolving into a centralized system, which encompasses a number of life safety functions.

There are three basic types of systems: "hard-wired" (device or zone of devices are connected directly back to the central alarm panel); "multiplexed", (devices are wired in zones or individually to data gathering panels); or "addressable" (each device transmits its own distinctive code through a common wiring system). Addressable systems provide the most flexibility because they can be programmed centrally via software and can reduce annual maintenance costs since they can be self-tested. Multiplex systems have limited programming capabilities and hardwired systems have none.

The type of system used depends on the type and complexity of the facility. The National Fire Protection Association (NFPA) and local Building Codes usually specify the type of occupancies that require fire alarm and life safety systems and the system to be used. Local codes and local inspectors, however, may do their own unique interpretation to the written requirements.

It is important to identify the fire alarm system required by code at the inception of each project. In general, the NFPA is the base however, a review with local authorities is essential to determine any variances to the standards.

The basic fire alarm system consists of the following components:

**Central fire alarm panel:** This is the central monitoring point of the system. All signals are brought to the panel and then emanate from the panel to initiate operation of the alarm devices, life safety systems and interface with other systems. The panels that are computer based store programming and data base information.

**Fire alarm pull stations:** These are manual alarm devices that are activated by pulling a handle. They are located in the path of egress to allow someone to exit quickly and still have the capability to send an alarm.

**Horns, gongs, and speakers:** These are audible devices that alert occupants to an alarm. Acoustic requirements, local codes, ADA and local fire department criteria require conservative layouts in design and installations. Speakers are utilized for systems that require "voice" instructions to transmit to occupants.

**Strobes:** These are visual alarm devices required by ADA to alert the hearing impaired. These devices have specific mounting requirements (i.e., 80 inches above finished floor).

**Combination speaker/strobe unit:** This is a combination of the speaker and strobe system in a common enclosure.

**Smoke detectors:** Many codes require a grid of zoned smoke detectors throughout a building; certain codes will waive the requirement for a fully sprinklered building. Typically the minimum smoke detector requirements for all occupancies include elevator lobbies for recall, machine rooms, electric closets and telephone rooms over 75 sq. ft., top of shafts, fire smoke dampers, HVAC duct systems, etc.

**Warden Station:** This "telephone" type life safety communication device allows two way communication between the floor and the central panel.

Fire alarm systems are typically specified under the electrical portion of a project, however, many systems related to life safety are specified under HVAC and Fire Protection work and require interface with the fire alarm system. These systems will be addressed in our next bulletin.