Meet both NFPA 520 Hz requirements for sleeping room applications

What organizations need to know about the 520 Hz sounder requirements for sleeping areas.

Audible appliances provided in sleeping areas are now required to produce different low frequency alarm signals - T3 for fire and T4 for Carbon Monoxide (CO) detection.

In sleeping rooms, the National Fire Protection Association (NFPA) added requirements for CO low frequency alarm signals to be annunciated separately from fire alarm in the 2009 edition of NFPA 720, Standard for Installation Carbon Monoxide (CO) Detection and Warning Equipment.

Effective January 1, 2015, NFPA 720 requires that audible alarms in sleeping rooms shall produce a low frequency T4 pattern to improve the effectiveness of waking up individuals when CO is detected.

For fire detection, the NFPA first introduced low frequency requirements in the 2010 NFPA 72, National Fire Alarm and Signaling Code, to wake up individuals in sleeping rooms. In section 18.4.5.3 in both the 2010 and 2013 editions, NFPA states that the alarm signal shall be a square wave with a frequency of 520 Hz ± 10 percent.

Even though both of the NFPA codes are for sleeping areas, the sound pattern is different based upon the detected condition (fire or CO).

Fire alarm applications require a T3 pattern while CO applications require a T4 pattern.

When does this code take effect?

The NFPA 720 code went into effect January 1, 2015.

The NFPA 72 low frequency requirements went into effect January 1, 2014 for sleeping areas in new buildings.

The Authority Having Jurisdiction (AHJ) may also require retrofit applications to comply with this code.

What type of facilities is required to comply with the new code?

Areas intended for sleeping:

- Hotel/motel guest rooms
- College/university dorm rooms
- Assisted living facilities

Areas that might reasonably be used for sleeping i.e. living room area of an apartment or condominium as it might have sleeping occupants

The NFPA 72 also states that audio systems that are providing service in sleeping areas must provide a pre and post tone that is a 520 Hz square wave.

Occupancies like hospitals and nursing facilities are excluded since trained staff are responsible for waking patients.

How can organizations meet the upcoming NFPA 720 code and NFPA 72 with one device? Eaton now offers two solutions: The Wheelock Exceder LED Low Frequency Sounders and the SAFEPATH in-building emergency communications system.
Background

In 2006, The Fire Protection and Research Foundation (FPRF) was awarded a Fire Prevention and Safety Grant by the US Fire Administration to study the effectiveness of alarms for emergency notification of high risk groups. As a result, the FPRF found that a “square wave sound with a fundamental frequency in the lower ranges (i.e. 520 Hz) to be more effective than the current high pitched smoke alarm signal across a range of populations (children, older adults, sober young adults, alcohol impaired young adults and adults who are hard of hearing).”

In the 2009 edition of NFPA 720, the code states that audible appliances in sleeping areas are required to produce a low frequency alarm signal (T4) for CO detection. It also requires that audible (CO) alarm must be annunciated separately from a fire alarm, and audible and visual devices for CO cannot reference “Fire” on the face of the device. Combination units can only indicate “Fire” on the fire indicating device. Prior to 2009, NFPA 720 only referenced 1 and 2 family dwellings. In the 2012 edition, the code was expanded to include sleeping areas in commercial spaces. This goes into effect January 1, 2015.

The 2010 edition of NFPA 72 requires that sleeping rooms must have low frequency audible and high intensity strobes for fire notification. For audible messages, the preamble must be a 520 Hz sounder with T3 pattern.

In typical applications in sleeping areas, a FACP is monitoring both CO detectors and smoke detectors and must sound a distinctive 520 Hz signal based upon the event (T3 for Fire, T4 for CO), which has merged the requirement for 520 Hz sounders for the FACP providers.

NFPA 72 code went into effect January 1, 2014 for those states that have adopted the 2010 version of NFPA 72.

The solution

Wheellock Exceder LED3 Low Frequency Sounder Strobes and Sounders

As the industry’s foremost developer in advanced technological solutions for fire, life safety and mass notification, Eaton’s Cooper Notification business has developed a single device to meet both low frequency sounder codes for sleeping rooms - NFPA 72 for fire alarm and NFPA 720 for CO alarm.

The Exceder LED3 Low Frequency Sounder Strobes and Sounders feature multiple 520 Hertz modes of operation.

- T3 (fire)
- T4 (CO)
- Continuous (coded)
- T3/T4 Sync Control

The 520 tone is generated within the appliance itself. When the selection switch is set for T3 or T4, the sound pattern is also generated within the appliance. When the selection switch is set to continuous, the product is listed for coded operations. The T3/T4 pattern or other pattern must be generated by the FACP according to the alarm condition sensed by the panel (fire or CO alarm).

When the device is set to T3/T4, the appliance switch can switch from T3 to T4 based upon the condition sensed by the FACP and passed to the Wheelock DSM Sync module.

Eaton offers low frequency sounder strobe models for both low (110) and high (177) candela settings, ideal for retrofits and new construction. This provides a simple retrofit for sleeping rooms. The Exceder LED3 Low Frequency Sounders and Sounder Strobes can replace an organization’s existing appliances with a single/dual function device, using the same single pair of wires that are currently installed.

SAFEPATH In-building Emergency Communications System

When packaged together with SAFEPATH audio boosters and Wheelock speakers, Eaton’s SAFEPATH SP40S, a multiuse system for emergency communications, paging, and voice evacuation, provides a complete solution, approved for sounding 520 Hertz (Hz) low frequency tones in sleeping room accommodations. SAFEPATH® system is now listed to UL 2017 (code 4), UL 864 (code 3) and the low frequency requirements of UL 464 (520 Hz), which enables the latest product offering from Eaton to meet both NFPA low frequency tone requirements for sleeping areas.

For applications requiring verbal communications, Eaton’s SAFEPATH system is designed to provide low frequency tones, followed by voice instructions with clear, intelligible messages broadcasted from Wheelock’s high-fidelity EH and LSPK speaker lines and S speakers to help ensure that the complete message will be understood in order to direct people to safety.