NEMA Standards Publication

NEMA SB 10-2016

Audio Standard for Nurse Call Systems

National Electrical Manufacturers Association

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Published by:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

www.nema.org

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FOREWORD

The preparation of this standard publication was initiated in response to input from the Veterans Administration. Input from other interested parties has also been sought and evaluated. Inquiries, comments and proposed or recommended revisions should be submitted to the concerned NEMA product subdivision at the following address:

Director, Technical Standards
National Electrical Manufacturers Association
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NEMA standards publications are periodically reviewed to meet changing conditions and technical progress, and the latest edition shall be used. Comments from the users of NEMA SB 10-2016 are welcome, and should be sent to the above address.

By way of introduction, a nurse call system is used in healthcare facilities to provide audible tones and visual indications to alert staff of patient requests for help or assistance. Audio (voice) communication may be provided in addition to the primary audible and visual signaling indications to optimize and enhance staff response to patient requests for attention or assistance.

NFPA 99 *Health Care Facilities Code*, together with NFPA 70 *National Electrical Code*® and applicable state and local building codes, determines the requirements for nurse call systems in healthcare facilities. As of the 2015 edition of NFPA 99, the requirements for nurse call systems are codified. Most states typically rely on NFPA 99 and NFPA 70 to establish state and local requirements with little, if any, change.

ANSI/UL 1069 *Hospital Signaling and Nurse Call Equipment* provides detailed and specific construction, reliability, performance, and safety requirements for nurse call systems and associated equipment. It defines the fundamental equipment required and fundamental operations of a nurse call system, as well as the requirements for installation and user operation. Comprehensively, ANSI/UL 1069 is in conformance with the requirements set forth in NFPA 99 and NFPA 70. However, there is no standard that defines audio performance characteristics.

Therefore, this audio standard, NEMA SB 10-2016, is intended to be used by nurse call system manufacturers to claim conformity to a consensus audio standard, even though there is no third party NRTL assessment, certification, or requirement.

This NEMA standards publication is the result of many years of research and investigation by members of NEMA and some members of the ANSI/UL 1069 standards technical panel. It was developed through consultation among manufacturers, users, and testing laboratories, and it reflects the study of the standards and technical documents identified in section 1.4, which were helpful in its preparation.

NEMA SB 10-2016 was developed and maintained by the NEMA 3SB-2 Health Care Communications and Emergency Call Systems Group. Publication of this standard does not necessarily imply that all members of the 3SB-2 product group voted for approval or participated in its development.

At the time NEMA SB 10-2016 was approved, the 3SB-2 Health Care Communications and Emergency Call Systems Group consisted of the following members:

Aiphone Corporation
Ascom US Inc.
Cornell Communications, Inc.
Curbell Medical Products, Inc.
Heritage MedCall LLC
Inovonics
Rauland-Borg Corporation
Silversphere Technologies Inc.
SimplexGrinnell LP
Techtone Sound & Signal Mfg. Inc.
Tyco Fire Protection Product

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Section 1
General

1.1 Scope

This publication contains the necessary requirements and test procedures to evaluate the audio quality of the loud speakers and microphones that may be provided in nurse control stations, patient stations, and pillow speakers of a UL listed nurse call system.

1.2 Purpose

This standard is intended to be used to evaluate the audio quality of a UL-listed nurse call system in an open-air installed system environment. It can also be used by manufacturers to establish pre-installation conformity with the requirements set forth herein.

1.3 Definitions

The following definitions apply to terms used in this standard.

intercom: The means by which two parties can communicate using the loudspeaking communications system, which may be integral to a listed nurse call system. For the purposes of this standard, the intercom is the actual circuitry that provides the audio communications capability. Also referred to as *audio communications*.

microphone: An electroacoustic transducer that converts acoustic energy to electrical energy. For the purpose of this standard, a loud speaker may operate as both a microphone and speaker.

mode A: A condition where the intercom is so configured that the nurse control station is “listening” to a patient via loud speaker, where the microphone is at the patient station or the pillow speaker.

mode B: A condition where the intercom is so configured that the nurse control station is “talking” to a patient via microphone, where the speaker is at the patient station or pillow speaker.

nurse control station (NCS): A required device of the nurse call system, which is intended to be permanently located at the nurses’ station to provide audible tones and visual annunciation of incoming call events. Typically, it also provides audio communication between the nurse and the patient. Many other features are optionally available. Also referred to as *nurse master station*.

patient station: A required device for a listed nurse call system, located on the wall behind the patient bed to allow patients or staff to summon help. It is typically activated by a call cord or pillow speaker and is required to be equipped with a call assurance indicator, which activates whenever a call event is placed. Also required is a reset switch for call cancelation. Typically, this device includes intercom circuitry for communications between patients and staff and circuits for television, entertainment, and environmental control.

pillow speaker: A required device for a listed nurse call system, sometimes called a pendant control, which may also provide intercom circuitry for communications between patients and staff and additional features such as speaker volume control, personal entertainment controls, and lighting controls.

pink noise: A random noise that is band-limited at 12 dB per octave, 20 Hz to 20 kHz equal energy per octave.

signal to noise ratio (S/N): The calculated ratio of the measured rms electrical value taken at the speaker when generating the minimum rated acoustic output level divided by the measured rms electrical value at the speaker when the microphone has been replaced with an equivalent resistive load.