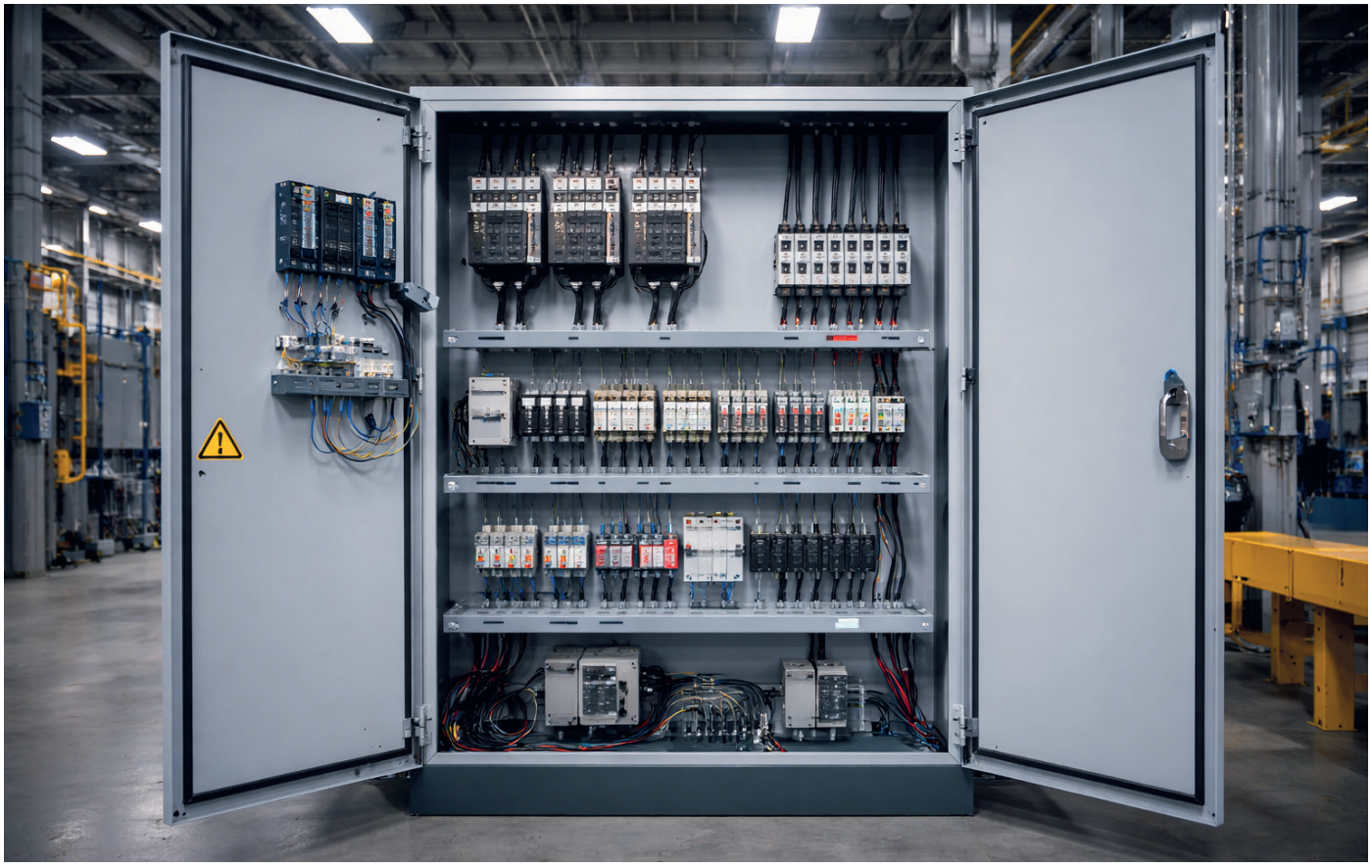
SONOTEC

Application Note

NFPA 70B 2026: Integrating Continuous Ultrasonic Monitoring with Custom SONOTEC Sensors

Overview of NFPA 70B 2026

NFPA 70B – **Standard for Electrical Equipment Maintenance** – establishes a structured framework for preventive and condition-based electrical maintenance programs. Starting with the 2023 edition, NFPA 70B transitioned from a recommended practice into a formal standard, enabling its adoption as a mandatory framework by organizations and authorities, and requiring documented electrical maintenance programs (EMPs) that reduce the risk of failures, improve safety, and enhance system reliability. The 2026 edition continues this evolution by emphasizing **continuous monitoring technologies** as part of modern condition-based maintenance strategies that complement traditional periodic inspections. Continuous monitoring is being recognized as a reliable method to detect developing faults before they escalate into failures or safety incidents, improving compliance and equipment uptime.



Why Continuous Monitoring Matters in NFPA 70B

While NFPA 70B has long endorsed periodic inspection techniques such as infrared thermography and electrical testing, the 2026 updates point toward technologies that provide continuous or high-frequency condition data rather than discrete inspection snapshots. Unlike infrared thermography, which detects thermal effects at a later stage, ultrasonic monitoring can identify faults at an earlier, pre-thermal stage.

This continuous approach helps maintenance teams detect both thermal and acoustic anomalies as they arise, enabling earlier corrective actions and trend-based decision-making – a core principle of predictive maintenance. Continuous data streams support documented condition assessments that align with the Equipment Condition Assessment model in NFPA 70B, which bases maintenance intervals on **physical condition, equipment criticality, and operating environment.**

Ultrasonic Monitoring in Electrical and Mechanical Systems

Ultrasonic monitoring directly supports NFPA 70B's shift toward continuous, condition-based maintenance by enabling early detection of developing faults. Ultrasonic testing extends condition-based maintenance into the acoustic domain by detecting high-frequency sound emissions associated with partial discharge.

This partial discharge can be caused by a multitude of reasons, such as:

- Insulation defects (most common)
- High electric field stress
- Contamination
- Thermal aging and overheating
- Mechanical stress and vibration
- Poor installation or workmanship
- Environmental factors

Ultrasonic sensors convert high-frequency acoustic signals into actionable data that maintenance systems can trend and alarm in real time – supporting NFPA 70B's focus on predictive techniques that flag issues before they cause unplanned downtime.

SONOTEC Custom Ultrasonic Sensors for OEM Integration

SONOTEC GmbH is a global specialist in ultrasonic measurement technology, with a strong focus on preventive maintenance and condition monitoring solutions. To support OEMs in implementing continuous ultrasonic monitoring in line with NFPA 70B, SONOTEC provides custom ultrasonic transducers and sensors tailored to specific application and integration requirements.

Key capabilities include:

- **Custom Sensor Design:** SONOTEC develops bespoke ultrasonic probes and transducers that meet unique geometric, performance, and environmental requirements for specialized applications.
- **OEM Integration:** SONOTEC's custom sensors can be supplied as fully integrated OEM components with defined interfaces and calibration characteristics, ensuring seamless integration into continuous monitoring architectures.
- **High-Sensitivity Ultrasonic Materials:** Proprietary piezocomposite materials and sensor designs deliver excellent broadband response and sensitivity needed for detecting subtle acoustic changes tied to early-stage faults.
- **Rapid Prototyping and Production:** With in-house development and manufacturing capabilities, SONOTEC can deliver prototypes quickly, transition to series production, and provide reproducible quality for large OEM programs.

Application Example

Ultrasonic sensors permanently installed on switchgear, motor control centers, or critical assets can feed continuous acoustic data into condition monitoring systems. Coupled with PCM/PLC/edge computing, this enables trending, predictive analytics, and alarms that align with NFPA 70B's continuous monitoring goals – providing early warning of degradation weeks or months before conventional inspection methods would detect the issue.

Sales & Support

SONOTEC US Inc.
10 Newton Place
Hauppauge, New York 11788
USA

+1 631 415-4758
sales@sonotecusa.com
www.sonotecusa.com

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