IEC 60601-1-8 Medical Alarm Signal Analyzer

KP-108 Medical Alarm Signal Analyzer for Auditory and Visual Alarm Testing

Standards: IEC 60601-1-8, YY 9706.108-2021

Manufacturer: KingPo Test Equipment Co., Ltd. www.dgkingpo.com Tel: +86-769-81627526

Product Overview

The KingPo KP-108 Medical Alarm Signal Analyzer is a specialized instrument designed to evaluate auditory and visual alarm signals of medical electrical equipment. It supports testing related to IEC 60601-1-8 and YY 9706.108-2021 standards by analyzing alarm sound patterns, indicator light flashing frequency, duty cycle, and priority recognition.

This analyzer is suitable for medical device manufacturers, third-party testing laboratories, R&D teams, and quality assurance departments for product development verification, laboratory testing, production quality control, incoming inspection, and test documentation. It integrates acoustic and photometric sensors with high-speed signal processing and automatic report generation.

Key Advantages

- **Designed for IEC 60601-1-8 and YY 9706.108-2021 Alarm Signal Testing**
  Engineering: Integrated acoustic sensor (100 Hz – 15 kHz) and photometric sensor with high-speed sampling (100–500 kHz) and FFT analysis for comprehensive auditory and visual alarm characterization.
  Benefit: Enables precise measurement of pulse timing, burst patterns, flashing frequency, duty cycle, harmonic content, and alarm priority recognition in full compliance with medical alarm standards.
- **High-Speed Signal Acquisition and Analysis**
  Engineering: Adjustable acoustic sampling rate up to 500 kHz, optical sensor response up to 100 kHz, and real-time FFT spectrum analysis for detailed waveform and frequency-domain evaluation.
  Benefit: Captures fast transient alarm signals accurately and provides deep insight into signal characteristics for robust product verification.
- **Intuitive Touchscreen Interface with Real-Time Display**
  Engineering: 10-inch capacitive touchscreen (1080 × 800) with real-time waveform, parameter display, and spectrum visualization for immediate test feedback.
  Benefit: Improves testing efficiency and reduces errors by allowing operators to monitor and adjust tests in real time without external software.
- **Automatic Report Generation and Data Export**
  Engineering: Automatic generation of test reports including waveform curves, frequency spectrum graphs, and parameter tables, with USB and LAN export capabilities.
  Benefit: Supports traceability, documentation, and regulatory submission requirements with minimal manual effort.
- **Compact and Portable Benchtop Design**
  Engineering: Compact dimensions (380 × 460 × 200 mm) and lightweight design (approx. 4 kg) with standard AC 220 V power supply.
  Benefit: Easy to integrate into laboratory and production environments without occupying excessive space.

Technical Specifications

3.1 Measurement Capabilities

Parameter	Specification	Remark / Notes
Applicable Standards	IEC 60601-1-8, YY 9706.108-2021	Medical alarm signal test requirements
Auditory Alarm Analysis	Pulse characteristics, burst patterns, duration, interval, rise/fall time, priority recognition	High, medium, low priority judgment
Visual Alarm Analysis	Flashing frequency and duty cycle	Optical signal acquisition and analysis
Acoustic Sensor Frequency	100 Hz – 15 kHz	For audible alarm signal capture
Acoustic Sampling Rate	100–500 kHz (adjustable)	High-speed signal acquisition
Acoustic Sampling Time	1–99 s	Configurable per test

Optical Sensor Response	Up to 100 kHz	For visual alarm signal capture
Wavelength Range	380–780 nm	Visible light spectrum
Optical Measurement Accuracy	±1%	For flashing frequency and duty cycle
Signal Processing	High-speed FFT analysis for harmonics and spectrum	Time-domain and frequency-domain analysis

3.2 System Configuration

Parameter	Specification	Remark / Notes
Display	10-inch capacitive touchscreen, 1080 × 800	Real-time waveform and parameter display
Communication Interface	USB, LAN	Data communication and export
Report Generation	Automatic report with waveform and spectrum graphs	Supports traceability and documentation
Power Supply	AC 220 V ±10%, 50/60 Hz	Standard laboratory power
Dimensions (approx.)	380 × 460 × 200 mm	Compact benchtop design
Weight (approx.)	4 kg	Portable and easy to move

Testing Principle

The analyzer captures auditory alarm signals via acoustic sensors and visual alarm signals via photometric sensors from medical electrical equipment under test. It performs time-domain analysis (pulse timing, burst patterns, duration, interval, rise/fall time) and frequency-domain analysis (FFT spectrum, harmonics) to characterize alarm signals.

The system evaluates alarm priority recognition (high, medium, low) based on defined patterns and provides objective measurement of flashing frequency and duty cycle for visual indicators. Results are displayed in real time and compiled into automatic test reports for traceability and compliance documentation.

Best Practices

1. Position acoustic and photometric sensors correctly and consistently relative to the device under test.
2. Ensure stable test environment with minimal background noise and controlled lighting conditions.
3. Use appropriate sampling rate and duration settings based on the alarm signal characteristics.
4. Verify sensor calibration and system functionality before critical measurements.
5. Review real-time waveforms and spectra during testing to confirm proper signal capture.

Typical Applications

- Medical device manufacturers — Alarm signal performance evaluation for patient monitors, ventilators, anesthesia machines, infusion pumps, etc.
- Third-party testing laboratories — IEC 60601-1-8 and YY 9706.108-2021 compliance testing
- R&D teams — Development and optimization of medical alarm systems
- Quality assurance departments — Production sampling, incoming inspection, and quality documentation
- Research institutions — Study of medical alarm signal characteristics and human factors

Supply Options & Support

Technical support is available for equipment setup, test method application, and compliance guidance.

Compliance & Manufacturer

This analyzer is designed for auditory and visual alarm signal testing in accordance with IEC 60601-1-8 and YY 9706.108-2021. It supports evaluation of alarm characteristics but final compliance assessment should follow applicable standards and laboratory procedures.

Manufactured under ISO 9001, ISO 14001, and ISO 45001 certified management systems. CE, RoHS, PSE,

and SGS documentation can be provided upon request according to the applicable equipment configuration.

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