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Sound Level Meters (English Translation)

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1 Scope

This Regulation applies to the initial verification, subsequent verification, in-use inspection of time-weighted sound level meters, integral average sound level meters, integrating sound

level meters that meet the requirements of IEC 61672-1.

2 References

This Regulation makes reference to the following documents.

JJG 176-2005 Verification regulation of sound calibrators

JJG 482-2005 Verification regulation of laboratory standard microphones (free-field reciprocity method)

JJG 790-2005 Verification regulation of laboratory standard microphones (coupler reciprocity method)

JJG 1019-2007 Verification regulation of working standard microphones (coupler comparison method)

JJF 1001-2011 General terms in metrology and their definitions

JJF 1034-2005 Metrological terms and their definitions for acoustics

JJF 1147-2006 Verification specification for acoustic performance of anechoic rooms and hemi-anechoic rooms

JJF 1293-2011 Verification specification for electrostatic actuators

3 Terms and measurement units

This Regulation adopts the quantities and units specified in GB/T 3102.7.

The following terms and definitions defined in JJF 1001-2011, JJF 1034-2005, GB/T 3947-1996, as well as the following terms and definitions, apply to this Regulation.

3.1 Sound pressure

The difference between the instantaneous total pressure and the corresponding static pressure.

3.2 Sound pressure level

The logarithm to the base 10 of the ratio -- of the time mean square of the sound pressure signal to the square of the reference value -- multiplied by 10.

3.3 Frequency weighting

The difference -- between the frequency-weighted signal level indicated on the display device and the corresponding constant amplitude sinusoidal input signal level, which is a specific function of frequency.

3.4 Time weighting

A time exponential function with a specified time constant, that weights the square of the sound pressure signal.

3.10 Time-average sound level

Equivalent continuous sound level

4 Overview

The sound level meter usually consists of a microphone, a preamplifier, a signal processor, and a display. The signal processor includes a specified amplifier with controllable frequency response, a device for squaring the time-varying sound pressure with frequency weighting, a time integrator or time averager.

5.1 Indication sound level adjustment

It shall be performed at the reference sound pressure level in the reference level range and at the verification check frequency in the range of 160 Hz ~ 1250 Hz.

5.2 Frequency weighting

5.2.1

The sound level meter shall have frequency weighting A; the Class 1 sound level meter shall also have frequency weighting C. The sound level meter that measures the

C-weighted peak sound level shall also be able to measure the C-weighted time average sound level.

5.2.4 For sound level meters and configurations with nominal operating modes

specified in the instruction manual, the relative frequency-weighted free-field response and relative frequency-weighted random-incidence response (if applicable) shall comply with the corresponding frequency weightings and acceptance limits in Table 1.

5.3 Frequency weighting at 1kHz

At the reference sound pressure level within the reference level range, for a 1 kHz steady-state sinusoidal electrical signal, the difference -- between the indicated sound level measured on C weighting and Z weighting and the indicated sound level measured on A weighting -- shall not exceed ± 0.2 dB. This requirement does not apply to the indication of peak sound level.

5.4 Level linearity

5.4.1

Within the reference level range, the level linearity range at 1 kHz frequency shall be at least 60 dB.

5.6 Time weightings F and S

5.6.1

The design target for the exponential time constant of the sound level meter time weighting F is 0.125 s and the time weighting S is 1 s. The decay rate of the indicated sound level shall be measured by suddenly terminating the input 4 kHz steady-state sinusoidal electrical signal. The decay rate of the time weighting F shall be between

31.0 dB/s and 38.5 dB/s; the time weighting S shall be between 3.6 dB/s and 5.1 dB/s.

5.8.1 The requirements for repeated toneburst response apply to A-weighting as well as

C and Z-weighting. The deviation of the measured time-averaged sound level from the time-averaged sound level calculated for the corresponding toneburst sequence, using a 4 kHz repeated electric toneburst sequence of the same amplitude and duration, shall be within the acceptance limit specified for the sound exposure level toneburst response in Table 2. The measurement shall be made on the reference level range of the sound level meter, 3 dB below the upper limit of the corresponding 4 kHz level linearity range, with the duration of the toneburst of 0.25 ms ~ 1 s.

7 Measuring instrument control

Measuring instrument control includes initial verification, subsequent verification, in- use inspection.

7.1.1 Environmental conditions

The verification environmental conditions of the sound level meter are as follows.

7.1.2 Reference environmental conditions

The reference environmental conditions of the sound level meter are as follows.

allowable measurement uncertainty in Appendix A.